

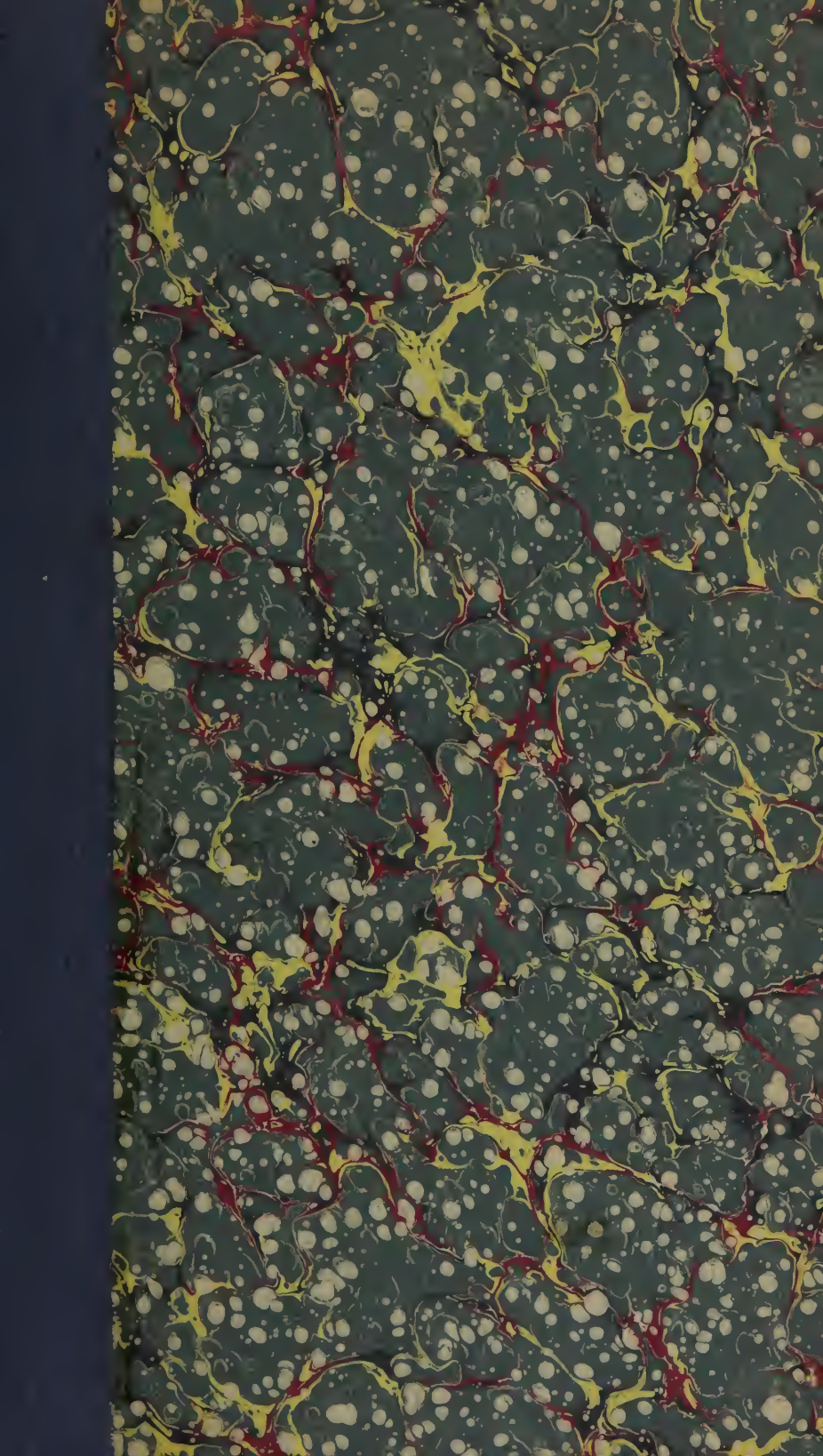
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DISEASES

OF

THE NASAL CAVITY

AND THE

VAULT OF THE PHARYNX.

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TRANSLATED FROM THE GERMAN OF  
DR. CARL MICHEL, OF COLOGNE ON THE RHINE,  
SPECIALIST IN LARYNGO- AND RHINOSCOPIC SURGERY,

WITH AN INTRODUCTION BY  
E. L. SHURLY, M. D., AND C. C. YEMANS, M. D.,  
OF DETROIT, MICHIGAN.

*FIRST AMERICAN EDITION.*

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## INTRODUCTION TO AMERICAN EDITION.

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Monographs by distinguished specialists, wrought out by large experience, develop many facts in pathology, diagnosis and treatment, important for both the general practitioner and the specialist to know.

This monograph by Dr. Michel is by no means an exception, and is a valuable contribution to the literature concerning our most common diseases in this northern latitude.

We have carefully read this work of Dr. Michel in the original, and also the translation of Mr. C. Jung, of this city.

The translator has faithfully done his work, and we think the treatise has sufficient merit to recommend itself to the profession in America.

Dr. Michel has contributed much to our knowledge of pathology.

His treatment has both novelty and success in its favor, especially his treatment of Catarrh, Ozena and Nasal Polyps.

Certainly his removal of polyps by aid of the galvano-cautery is preferable to our method of removal by forceps.

Tearing a polyp from its attachment is a very painful operation, having often unpleasant consequences as well as failure in curing the patient.

The anatomy is faithfully and carefully stated.

We hope all who read the within will have the pleasure to gain some knowledge, which will be helpful in combating some of the most common and obstinate diseases, with which we meet in every day practice.

C. C. YEMANS, M. D.

E. L. SHURLY, M. D.

DETROIT, Mich., Sept., 1877.



## PREFACE.

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When I took up my abode here in Cologne, about six years ago, it was my intention to confine myself exclusively to diseases of the chest and the throat. But gradually this field expanded, and I was induced to include the nares, the vault of the pharynx, and the organs of hearing. I was thus compelled to include one after another, because of their close relations.

The difficulties, which I had to overcome, were not small, and I was in a measure obliged to be my own teacher; but I was soon rewarded with extraordinary success in healing (*Heilerfolge*). Soon I gathered a large amount of material; and I was also able to make a number of new discoveries, regarding the knowledge and treatment of diseases in the nasal cavity and pharyngeal vault. To report these is the object of the following pages.

DR. CARL MICHEL.

COLOGNE ON THE RHEIN, February 1, 1876.



## INTRODUCTION.

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It cannot be gainsaid, that heretofore the nasal cavity has been treated with a disregard, to say the least, which is so much the more strange in the face of the fact, that it furnishes the natural medium for respiration; that it serve in one of the most important functions — breathing; that it is indispensable for a pleasant voice; that it is the organ of one of our senses — of smell.

In the text books the chapter on nasal diseases is soon hurried over. In all, the same common presentations of “Epistaxis, Nasal Polyps, Malignant Tumors, Bad Distortions (*grobe Zerstörungen*), and Injuries of the Exterior Frame,” are crowded together on a few pages. Pathological anatomy, it seems, is seldom attended to except accidentally, or else the nature of ozæna for instance would have been explained long ago; and the incorrect views concerning it would have been exposed.

In practice it is not at all customary to examine the cavity—although the speculum is much easier to handle than the laryngoscope and the pharyngoscope. Generally the point of the nares is raised somewhat, and then the vague pronunciations are uttered: “high up in the nares,” or “deep down in the nares.” It cannot be wondered at, therefore, that the diagnosis and therapeutics of nasal diseases are in a mixed condition (*im Argen liegen*—lie in wickedness); that *scrofulous ulcers* are still playing a large role; that the nasal douche, snuff water, and bathing in salt water were in many cases applied in vain or with but little relief, and was quite inadequate in comparison with the inconvenience the patient had to go through. Even *Voltolini* in his book, “the Application of Galvano-caustic in the Pharynx, Pharyngeal head, and the Nasal Cavity, to which I owe my first impulse to treat nasal diseases, after describing the operation of nasal polyps, confines himself to the remark, that on the anterior end of the interior turbinated bone a round tumor, having the form of a pear, was often to be seen in the exterior opening of the nares.

*Schroetter* in his laryngoscopic reports speaks in a few words of the treatment of ozæna, of chronic catarrh, of polyps, and

*Zaufal* has described anomalies in the development of the turbinated bones, in the "*Aerztlichen Correspondenzblatt, Prag, 1874.*"

Besides this, I am not aware, that anyone has ever described the nasal diseases as comprehensively and precisely as I have tried to do in this book; nor has there ever before been such observation on living subjects, and such results reached thereby, as I have described in the chapters on "Chronic Catarrh, Ozæna, Syphilis in the Nasal Cavity." In the chapter on "Tumors" of the nasal cavity, I think, there is also to be found so much progress as to the diagnosis and therapeutics, that I had occasion to treat of the subject anew.

I may also be allowed to mention, that since *Semeleder* and *Voltolini* have spoken of the nasal examination anteriorly, nothing has been published in this regard; and in comparison with what has been said by these men, thus eminent in the field of pharyngoscopic investigation, I think my directions for examining the cavity will be found more systematic and complete. The number of diseased nasal cavities, which I have examined in about four years, is about 450; if I add 94 patients who were troubled with hypertrophied pharyngeal tonsils, and whose nares were also carefully inspected and those, whose nares were found to be healthy, with an affection of the throat, I can say, that I have at least examined 850 different nasal cavities with the speculum, aided by the calcium light.

The experience thus made, and the knowledge thus gained, I have tried to record in the most condensed form. It was therefore also necessary to confine the data of patients to but a few cases, of the very great number which I have recorded.

Nor did I deem it necessary to add an anatomy of the nose, because I could have produced nothing new, but could at best have given a new version of what is already found in other works.

But if thus the book has become insignificant in size, I hope nevertheless, that no blame or unfavorable prejudice will be caused thereby.

As to the diseases of the pharyngeal vault, my observations in part corroborate those of *Voltolini, Meyer, Wendt*, but for the greater part they supplement them, as I show, that the pharyngeal tonsil appears very often hypertrophied in a moderate degree (*mittlerem Grade*), and mention the symptoms (*die klinischen Zeichen*), and give direction for diagnosis with the rhinoscope, and

for a treatment, by which the tumor can be removed easily and without danger, even by those who have not had much practice before.

It would be better to apply the term rhinoscopy to examination with the speculum, whilst pharyngoscopy might describe that with the mouth mirror.

To the diseases of the pharyngeal vault some observations have been added concerning the consequences upon the entire organism, the voice, and the speech, which grows out of the obstruction of the nares, and also its relation to hard hearing.

Among the remedies the galvano-caustery takes the first place. Whoever will apply the same with a careful use of the speculum, will find that it is the most agreeable to the patients, and the surest and quickest as to results. To show that I am not prejudiced in favor of it, I freely confess, that I would prefer another treatment, which had the same merits. For as long as a stream sufficiently strong for caustic purposes cannot be produced in a dry way, inconveniences and disagreeable circumstances will always be connected with the application of the galvano-caustery. The instruments which I use are those recommended by *Voltolini*; where I found it best to modify them, I have mentioned this in due time. The battery is that of *Middeldorf*.

Several times in the year I pour about a small teaspoonfull quicksilver into the glass cylinders. As the battery works, the quicksilver rises on the walls of the cylinders; and if thus the battery is cleaned immediately after taking it apart, it takes but a few moments—the quicksilver being rubbed off makes them shine instantly. But if there is a black spot, which yields slowly, the cloth for washing it is made wet in saltpetre or concentrated sulphuric acid, then this spot will also yield by rubbing the cloth over it a few times. But it is necessary to wash the acid off with water in order that it does not corrode.

It is not necessary therefore to have a tray for the amalgamation of the zinc-cylinder. The charcoals are always covered with water. I always use the same cells (*Tonzellen*), though the battery is used four or five times a day. They are neither made wet nor dry, as formerly was thought necessary previous to every use of them.

If the acids were not too old, the current remained evenly strong for about three hours, a fact which I have always noticed.



After I had once become familiar with the batteries, which I have constructed more than a thousand times--I use the galvano-caustery also in the mouth and in the throat—it has never failed me, without my being able to find the cause of failure and to remove it.

The rules for direction may be given in a few words:

If the acids are fresh\*—have not been used too often, if the zinc cylinders are well amalgamated, greasy, shining, not opaque, blind, then the source of the current is opened. But if, nevertheless, the platinum glows not or but slowly, and the platinum is made thinner with the hammer or the file, in case it were somewhat thick, then the trouble must be looked for in the conducting. Either the rings, which contain the charcoals are not clean at the inside, or the conducting wires proceeding from them and the zinc contents (*Zinkelementen*) are not clean, there is too much quicksilver in the vessels, or the wires do not come into contact with it, or the anterior vessels covered with copper are soiled, or this is the case with the exchange-pane (*Wechselscheibe*). Also the shells (*Huelsen*) for the reception of the conducting wires on the exterior of the box, or the pivots may be in a state of oxidation, and thus incapable to conduct, the surface on the handle coming in contact with them, is oxidized through much use, or the conducting wires touch somewhere. Of the exchange-pans I always use the one giving the strongest current—the pillar.

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\*I renew the nitric acid after the batteries have been used from three to six times, according as they have been used for a longer or shorter time. It must be clear, not dark, blackish-green. If it is relatively or entirely fresh, the conductors in order and the current not as it should be, the glowing heat weak, I pour about a teaspoonful of concentrated sulphuric acid into the cylinders (*glasbehälter*) and thus renew the mixture of sulphuric acid.

# EXAMINATION

—OF THE—

## NASAL CAVITY ANTERIORLY.

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I always use the speculum of *Charrier*, modified by *Voltolini*, by which the nares are much widened.\* It is better than that by *Frankel*, because being funnel-shaped and semi-cylindrical, it catches up and concentrates the rays of light. My source of light is generally the calcium lamp of *Bruns*. The considerable brightness of its light makes examination and operation easier than the common pharyngeal lamp, which, however, is also quite useful.

But that sunlight is best calculated for a minute distinction of colors, is self-evident. The patient to be examined sits with his head in the common position. If now light is thrown into the cavity through the speculum by means of the reflector, then the eye falls in the first place on the anterior end of the inferior turbinated bone at the entrance of the bony cavity. As the head is gradually lowered toward the front, the inferior turbinated bone is inspected along the septum to the end of its choana. A more or less broad ray of light falls in between the latter and the septum upon the posterior wall of the pharyngeal vault.

In swallowing, or in giving a sound, the movements of the latter are plainly to be seen, and a part of the soft palate and the inferior end of the Eustachian tubes are often to be seen much elevated.

The free border of the inferior turbinated bone on an average remains  $\frac{1}{2}$  to  $\frac{3}{4}$  of a centimeter from the nasal floor. The inferior meatus is completely open to view. Sometimes one can see through under the posterior end of the turbinated bone into the pharyngeal vault, but in most cases the crevice between it and the nasal floor is too small for this.

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\*In this country Goodwillie's is the best.—C. C. Y.

The nasal floor, sometimes a little hollow from one side to the other, and always sloping posteriorly, is best illuminated with the head strongly bent forward.

On the convex (superior) surface of the turbinated bone isolated uneven spots are seen, which are caused by the roughened condition of the bone. It can be inspected very well to the posterior part, where the middle meatus is too narrow and the turbinated bone descends too abruptly.

As the head is bent backward, the concave (inferior) surface and the free border of the middle turbinated bone comes in sight. If the latter is to be inspected to its anterior end, then it will be necessary to bring the head completely into the neck. It will then also be noticed, that this one is a few centimeters shorter than the inferior turbinated bone, that it appears much farther back of the anterior opening of the nares than the former.

The turbinated bones (the third being very small, and as a rule not visible anteriorly,) are sometimes flattened, level; or again they have a distinct shell form and spring in wide arches from the side wall, in which case the concave surface is broader and can be completely illumined.

In the posterior part of the nasal cavity, especially in narrow nares, the border lines of the turbinated bones run across each other on account of the middle turbinated bone, which in extending from before backwards, curves decidedly inwards. In young persons the middle turbinated bone, hanging in its anterior portion perpendicularly over the nasal floor, appears to originate from the roof instead of the side wall of the nasal cavity.

Directly over the anterior end of the middle turbinated bone the rounded acute angled roof of the nasal cavity is to be seen, but generally only the anterior part of it; because, as a rule, only a small crevice remains free between the middle turbinated bone and the septum.

In a few cases, where the patients were suffering from *ozæna*, and had very wide cavities, in which the third turbinated bones, sitting posteriorly upon the middle ones, were also largely developed, I could clearly inspect the roof of the nasal cavity from the front to the choanes.

In these cases I saw about  $1\frac{1}{2}$  to 2 cm. above the choanum (generally on the left side) a round hole, or a crevice, through which the probe passed into a cavity, which could be nothing else but the cavity of the sphenoid bone. The roof of the cartilaginous nose of course lies free before one's eyes.

The septum is open to inspection nearly in its entire extent, except the small part pertaining to the superior meatus, and generally the border of the choanes, which can only be illuminated in broad nasal passages. It is, as is well known, often bent, in the cartilaginous part as well as in the bony one, and in accordance with this concavity, or the number and size of bone projections or edges from the septum, or the *crista nasala* on the nasal floor, one nasal passage is narrower than the other, and can be less completely inspected.

The color of the mucous membrane is rose-red, in spots yellowish, on account of the bones and cartilage shining through. If one inspects closely, he finds, that the red color is brought about by numberless point-like plexi, which are very close to one another.

Anteriorly on the septum a small light red blood vessel can often be traced to the nasal floor. The concave surface of the middle turbinated bone, which can be seen in most cases, always has the light color of the bone showing through.

The mucous membrane is smooth and shining, lies more or less closely attached to the nasal floor, the septum, and the middle turbinated bone, which fact is demonstrated by an examination with the probe. In the same way the middle turbinated bone is felt to be unyielding, bony; and also, that the inferior turbinated bone on the convex (superior) surface, especially toward the free border, is more elastic, so that one has to press it in more deeply in order to feel the bone (in consequence of the greater abundance of blood vessels in the submucous connective tissue.—*Kohlrausch*). The nearer one gets to the posterior end, the softer it is to the touch.

The probing is felt very keenly, where the mucous membrane is sound, not loosened or thickened. During an examination with the probe it sometimes happens, that even strong, healthy men suddenly become pale, unwell, and half fainting. Sometimes cough ensues.

## EXAMINATION OF THE CHOANAE-OPENING OF THE NASAL CAVITY AND THE PHARYNGEAL VAULT.

With the rhinoscope, by which the posterior ends of the turbinated bones can be distinguished as much as is necessary, the examination of the nasal passages can and must be completed. Formerly I was accustomed to use the little round mirror with long handle, which has been recommended by *Voltolini*. It is about  $1\frac{1}{4}$  to  $1\frac{1}{2}$  cm. in diameter, made of thick glass, which has a clear white (not a green) appearance on the edge. The handle is nearly in the position of a right angle to the surface of the mirror.

Lately I have used the rhinoscope, which I have especially recommended for the study of the Eustachian orifice, with good result. First it is brought into the pharynx, then its surface is arranged by pressure on an attached lever, so as to be in the right position. Let the space between the base of the tongue and uvula be ever so small, there will be no gagging caused by touching these parts, or by pressure on the tongue, which is further prevented by the handle remaining stationary, while the position of the mirror is being changed. The circumstance, that the surface of the mirror ( $1\frac{1}{2}$  cm. in diameter) can thus be placed quite at a right angle, makes it possible for the entire posterior surface of the soft palate and the posterior ends of the inferior turbinated bones of the nares often to be completely inspected, which otherwise could only be accomplished in exceptional cases, where the pharyngeal space is very wide.

The patient must open his mouth very wide, show his teeth, push back his lips, keep his tongue in the mouth, breathe quietly, and if possible not think of the examination.

In front of the uvula the tongue is held down with the spatula,—sometimes it offers so little resistance, that it can be held down with the unmovable handle of the mirror—and the mirror is conducted past the uvula at its side, or below in the same manner, if the space is large enough, close to the posterior pharyngeal wall. Touching the parts is to be avoided, but especially the borders of the posterior palatal arches, which if touched instantly produce gagging.

As far as I know, it has been hitherto recommended by every one, that the image of the septum is first of all to be found. I

deem it easier, and more systematic, however, to begin with the posterior wall of the pharynx, and from there to examine the pharyngeal vault. (*Cavum pharyngeal nasal.*)

If the surface of the mirror is at an obtuse angle (approaching the right angle) to the posterior wall, then the latter appears in the mirror as a rose-red, damp-shining surface. The more the position of the surface of the mirror approaches an obtuse angle to the pharynx, the higher the eye ascends on the posterior wall. Soon it is noticed, that the surface grows uneven, and one sees either small shallow depressions or small hole like oval or round recesses, or smaller or broader open furrows not very deep. They mark the side of the pharyngeal tonsil. In the normal condition of this glandular bed (*Druesenlager*) the unevenness of the arch, caused by it, is thus insignificant and indistinct to the eye, while the surroundings of these recesses are elevated so little, the two or three longitudinal edges causing these furrows, are thus low, that one has to look sharp in order to distinguish them.

A little movement of the mirror toward the right or the left brings to view the place, where the posterior meets the lateral wall. Here is the fossa of *Rosenmueller* with the anterior border thereof, the Eustachian tube, which is sometimes connected with the bottom of the fossa, or the posterior wall, i. e., the lateral part thereof, the pharyngeal tonsil, by short bridges of mucous membrane. If now the handle of the mirror is lowered but very little, the eye glides over the projection of the Eustachian tube into the yellow-white orifice of the same.

Again the surface of the mirror is brought into the horizontal position. Once more the posterior wall of the pharyngeal head (*Schlundkopf*) is seen. As the handle is now more and more lowered, and the surface of the mirror is thereby more and more brought into a position parallel to the long axis of the pharyngeal vault, the eye will follow in the first place the pharyngeal tonsil to the pharyngeal roof, when a clear white spot appears, which is the *alae vomeris*, and finally the one or the other choane—in large mirrors both the choanae—come to view.

Brightly illumined and first to be seen is of course the superior elliptical arch. Below farther toward the front, within the nasal cavity, the superior turbinated bone as a light edge, bordering quite closely to the septum. Below it (the sup. turb. bone) and separated from it by a half dark shade—the superior meatus—a roundish object comes to sight. It is smooth on its surface,



of yellow-red or gray-reddish color; it is the posterior part of the middle turbinated bone. It lies nearer the side wall and farther from the septum. It can be followed up with the eye for a distance into the nasal cavity, into which it projects quite freely, as the middle meatus has the greatest width here.

By a further lowering of the handle the inferior border of the middle meatus, and the inferior turbinated bone come to sight. Generally the superior half of its posterior end can be seen. It is of round knob-like shape, light-gray and smooth, or a little rugged on its surface, and approaches the septum closer than the middle turbinated bone.

The inferior half of it, as also the floor of the nasal cavity, are mostly invisible; because the soft palate, which appears as a pale surface, strongly convex in its centre, through the base of the uvula, covers them curtain-like from one end to the other. But in deep pharyngeal cavities, where it is possible to bring the mirror more nearly opposite these parts, the posterior end of the inferior turbinated bone can be illuminated in its whole extent, and also the posterior part of the nasal floor. With the movable mirror one can always succeed in this, where the soft palate is lax, and the pharynx is not too narrow. The septum, which superiorly on the pharyngeal roof divides fork-like (*alae vomeris*, for the reception of the *rostrum sphenoidale*), otherwise appears as a sharp edge, placed perpendicularly in the centre of the entrance to the nasal cavity.

An elevator for the uvula is not necessary, as the little mirror can be conducted past every uvula at its side. The palate-hook, with which the uvula is forcibly pulled down, has but a limited use. The posterior surface of the soft palate (richly supplied by the *glossopharyngeal* and *vagus* nerves) is generally very irritable, and thus spasms of the superior pharyngeal muscle can easily be induced by reflex action, through which the cavity is annularly closed to such a degree, that only around the hook a little light can be thrown up, and thus only the centre of the pharyngeal roof can be inspected. If the uvula rises even at the least pressure upon the tongue, or by a simple opening of the mouth, and the pharynx is of small dimensions, as for instance with children, then the examination is often very tiresome. The mirror has to be held patiently in front of the posterior wall until the uvula sinks down; then the favorable moment is to be quickly improved.



If the patient says "on" (*Voltolini*), or knows how to breathe strongly, chiefly exhaling through the nares, with his mouth wide open, then the uvula falls for a short time, and the light can ascend.

A strong tendency to gagging, which comes as quick as lightning, if the tongue is barely touched with the spatula, or even if the mouth is opened, is one of the most disagreeable hindrances. But this can be removed with a certainty in a few days, if the patient will several times daily press down the tongue from twenty to thirty times with the handle of a spoon, so deep that he can see the uvula and a part of the posterior wall of the pharynx in the mirror. If gagging ensues, let him lay aside the spoon, wait a few minutes, until the feeling of nausea is past, and then try it again.

From the foregoing it will be seen, that generally of the entire nasal cavity only the roof and the convex surface of the middle turbinated bones—viz, the superior meatus—for a distance of 2 to  $2\frac{1}{2}$  cm. cannot be brought to view.

But if these parts are affected by ever so small a tumor, it must hang down, and thus be seen. A tumor at all worth looking after, will cause so much swelling in the surrounding parts, that it can be brought to light, and distinguished either with the speculum or the rhinoscope.

I believe that I have shown by this presentation, that the nasal cavity can be as completely illuminated and inspected as any other cavity of the body, and as much as may be absolutely requisite for medical treatment.

## DISEASES OF THE NASAL CAVITY.

### I. ACUTE CATARRH.

The origin of acute catarrh, if we except infectious diseases, is mostly to be referred to a sudden cooling off of the hot skin, especially the feet (which after vigorous exercise are perhaps placed on a cold floor) or of the back. Between the shoulders and hips, where the clothes are not very tightly attached to the body, and where evaporation of heat can take place easiest, and quickest, the cold is felt very soon. A disagreeable shudder comes over one, and immediately a sharp tickling is felt anteriorly in the nares, followed by violent sneezing. One or both nares become impassible to the air; a watery mucus collects unceasingly therein, which can hardly be managed, and calls for continued use of the pocket-handkerchief. After a few days, the secretion becomes thicker and yellow, and after about fourteen days it nearly ceases, when the nasal cavity is again open.

Often it amounts only to a repeated sneezing, a quickly passing obstruction, and a somewhat increased watery secretion, viz., during a longer stay in a cold room, sitting near a window not airtight, or stepping on a cold floor after one has arisen, or during the night, when an arm is taken out from under the cover, and is for a time exposed to the cold air of the room. Whether the cooling off that has taken place on different parts of the body, brings the blood contents of the nasal mucous membrane under an increased pressure, or whether the capillaries expand, and the trigeminus nerves are irritated thereby\* (*Mordhorst*), or whether the tickling is a concomitant sensation and brought about in a reflex way, with the sneezing, expansion of the vessels, swelling of the inferior turbinated bone, and the mucous membrane, and the suddenly increased secretion. I am not prepared to say.

If the side-cavities are more strongly affected, it will be marked by more or less violent headache, pressure over the eyes, &c. But it is not necessary to tarry with these sufficiently known

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\* *Ursachen, Vorbeugung, Behandlung der Lungenschwindsucht.*—Berlin, 1874.

phenomena, which are frequently accompanied by other catarrhs and fever.

The inspection with the speculum shows especially the inferior turbinated bone much hypertrophied, and that it lies close to the nasal floor as well as to the septum. Its mucous membrane is smooth and vivid red; that of the septum and the nasal floor is also found to be spongy, and raised in the anterior part of the cavity, which only can be seen. Of the middle turbinated bone, nothing at all, or only a very small part of its anterior end is to be seen.

With the rhinoscope the posterior ends of the turbinated bones are found to be adœmatous, swollen, gray or gray-reddish. The inferior often project out of the choane. The septum is also often evenly thickened, intensely red, or grayish-red. In cases of violent acute catarrh, the turbinated bones and the septum touch each other. The entire pharyngeal head is intensely reddened; the openings of the Eustachian tubes are frequently narrowed by swelling, their yellow-white color having given place to a more rose-red one. Vascular branches of considerable size are sometimes seen to go there from the velum. The pharyngeal tonsil appears all over darkly reddened, and is in consequence of the swelling more distinctly to be recognized.

The therapeutics pertaining to acute catarrh, has established in general, that it cannot be checked; hence it has to run its course. The mixtures of carbolic acid, solution of ammonia, hypermanganate of potassium highly diluted with water, and used as "snuff-water," free the nares momentarily; but I cannot say from experience, that the course of the catarrh becomes really shortened thereby.

The immediate influence of these remedies may perhaps be looked upon as not so much disinfecting, as astringent, by contracting the vessels, through which the diminution of the swelling on the inferior turbinated bone and the mucous membrane, the opening of the cavity, and the decrease in the profuse watery secretion are brought about. *P. Niemeyer* recommends warm baths, followed by a cold douche.

If the stage of muco-purulent secretion does not stop otherwise, then insufflations of nitrate of silver one part to twenty of talc., which is done by means of a strong glass pipette, one end of which is cut out shovel-like—so that the powder may be easily

taken up—while the other end is curved, so that the insufflation can be accomplished from through the mouth.

Over the shovel-formed end of the pipette the end of a rubber tube about one foot long is drawn, after about 1 to  $1\frac{1}{2}$  cm. of the pipette has been filled with powder. Then the tongue is held down with a tongue-depressor; the curved end of the pipette is introduced behind the uvula, and then upward, until certainly no resistance is felt, which indicates, that the opening of the insufflator is now above the narrow arch, formed by the soft palate and the superior pharyngeal muscle. A little shifting to the right or the left points the opening to the choane of that side. And now, if one suddenly blows strongly into the tube, a little cloud of powder is immediately thereafter seen to come out of one or both nares.

The rhinoscope shows the posterior ends of the turbinated bones, which are especially vascular, more or less completely covered with powder. Through the speculum it can be seen, that the septum, the inferior and middle turbinated bones are also covered, but not so densely.

Some patients are immediately after affected with headache, flowing of tears, redness of eyes, pain over one or both eyes, and sneezing. But these phenomena last only a few minutes in this disagreeable degree, unless the powder used has been too strong.

According as they are borne, one to three insufflations are made successively. One or two repetitions on the second or third day will suffice, and the mucus will no longer be thick, yellow, but clear, transparent, normal.

Insufflations from the anterior do not work so quickly and successfully. They are accomplished with a straight glass pipette, that can be exchanged for a goose-quill, which is also cut out like a shovel, on one end. The opening is brought into one of the nares, while the pipe is held in horizontal position (not higher posteriorly), in order not to throw the powder directly against the roof of the nares and the middle turbinated bone, where the olfactory and ethmoidal nerves branch out, and where it might therefore cause violent headache, lasting for hours.

After the insufflation the septum, the convex surface of the inferior, and the concave surface of the middle turbinated bones, also a part of the pharyngeal roof may be seen covered with powder. If a region is to be reached especially, this can easily be accomplished by a little movement of the opening to the right, the left, upward, or downward.

I prefer the application of medicine in the form of powder, because it can be easily accomplished. because the powder sticks better, works with more energy, and because the brush soon loses its liquid by hitting against the walls of the nasal cavity—or in case of application from the mouth—the superior pharyngeal muscle and the soft palate may have pressed it out, long before it reaches the choanes.

Where the side cavities participate in a marked degree, cold cloths are to be applied to the forehead and nose, leeches at the entrance of the nares and at the root of the nose, cathartics, and, in short, an antiphlogistic treatment will prove most serviceable.

I have repeatedly seen cases, where according to my impression the muco-purulent stage in those cavities alone had lasted for months. The patients complained, that aside from the moderate obstruction in the nares, yellow cream-like mucus would loosen itself in great abundance at times, and run down into the throat, and that an uncommonly bad, stale odor, connected with it, would give notice of the fact.

Examination would show first of all, that the inferior turbinated bone was normal, but the middle, i. e., its mucous membrane, was hyperæmic in a high degree, and swollen, that it was lying close to the septum throughout, with the middle meatus much reduced in the middle. In touching the mucous membrane with the probe, I noticed, that it was considerably raised from the underlying bone.

In one case I could, after pushing aside the intensely reddened mucous membrane coming out from under the anterior end of the left middle turbinated bone, see yellow mucus dropping down profusely. The patient complained frequently of pain on the left side of the forehead, which would diminish after a sudden discharge of yellow secretion. No doubt, he suffered from purulent inflammation of the left frontal sinus. Strong solutions of chlorate of potassium (from two to three tablespoons to one liter of water) applied twice a day [vid. art. ozæna], in connection with insufflations, which of course did not reach the sinuses themselves, but only the anterior wall of the ethmoid cavity, and the middle turbinated bone, but could nevertheless exert a beneficial influence, and thus perfected a cure in a short time.

Some persons came who complained of having to sneeze violently for some time, the sneezing accompanied by a profuse watery secretion; and that once a day, or once or twice a week, without any

known cause, in awaking, or arising, or at the moment of stepping from the room into the open air, or vice versa, this would happen; that only very little or no obstruction was connected with it, that yellow mucus would not be discharged at all, and that the catarrh would often pass away within a few hours or a day without coming to this stage.

In examining the nasal cavity, I could not find any abnormality whatever, and believe that the ailment was caused by excessive sensitiveness of the skin. I have tried to overcome this by an ablution of the whole body in cold water every morning, which would toughen it.

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## II. CHRONIC CATARRH.

In German it is generally called *Stockschnupfen* [permanent snuffles], by which is designated an obstruction of the nares of long standing, sometimes more moderate, sometimes more violent, accompanied by an uncommon production of mucus, and by nasal speech. The latter immediately reveals the affection, and it is often very disagreeable to be obliged to listen for any length of time to one who is troubled with it; often it stamps the patient with the appearance of imbecility. The color of his face is pale and sallow in a high degree; his appearance is older than corresponds to his real age. The obstruction is often acutely increased with sneezing, and large masses of tough, purulent mucous secretion have forcibly to be blown out, which are barely removed when it accumulates again. The restless sleep, the choking and tormenting every morning, as the mucus, gathered in the pharyngeal vault is being removed—combine to make chronic catarrh a very annoying affection.

Sometimes the excessive production of mucus is a more prominent symptom than the obstruction. This is partly owing to the fact that the concerned nares are so large, that even considerable swelling can take place therein, without serious obstruction.

On the other hand, with anæmic persons, having a pale dry skin, the obstruction (with an ever present tendency for acute catarrh) is a more prominent symptom. *Nasal speech of course being modified by the degree of obstruction.*

A strong, sharp, disagreeable odor, as in ozæna is not found, but sometimes a weak sweetish, stale one.



Very often the sense of smell is disturbed, but it generally returns in the course of treatment in a very satisfactory degree, even after it had been absent for years. The number of patients having chronic catarrh with hypertrophy, treated by me, is 81; 54 of them were males, and 27 females, aged from 8 to 50 years.

#### EXAMINATION.

In well marked cases the speculum in the first place shows, that the anterior end of the inferior turbinated bone is swollen. This swelling often changes under one's eyes. It sometimes passes away transiently after bleeding, especially on the posterior end of the inferior turbinated bone, after cauterization or rubbing with the probe [in consequence of a contraction of the vascular tissue]. Sometimes it also diminishes during the inspection of the cavity, evidently because the vascular tissue is incited to contraction in a reflex way, by the expansion of the nasal wings.

It is therefore only a symptom, the treatment of which alone has no influence on the condition of the entire situation. An extended swelling is very seldom noticed here. The surface is mostly smooth, and of a gray, pale color.

A closer inspection shows, that the entire turbinated bone is swollen; that it lies for the greater part of its extent close to the septum. The view through the nares into the pharyngeal vault is more or less prevented. The convex surface is also smooth, bluish pale, not reddened. One has to press deeply into it, in order to get to the underlying bone, and as soon as the probe is removed, the depression ceases.

On the inferior (concave) surface in older cases a white granular mass is seen, which has the appearance of frogs' spawn. Anteriorly it generally fills only the space between the turbinated bone and the nasal floor; but posteriorly it is present in such large masses, that it comes out from under the turbinated bone and reaches to the septum. Thus the greatest part of the inferior meatus becomes impassable. With the probe this mass feels soft, is moveable from one side to the other, and nearly insensible.

The middle turbinated bone has also a white-grayish, mouldy appearance on its concave surface. On its border, especially on the anterior end, the thickened mucous membrane has become lowered, is abnormally long, has a crestlike form, and can be moved hither and thither; it is often spongy and raised up from its underlayer over the entire concave surface, which fact can be plainly ascertained by the probe.



Sensation is everywhere much diminished.

On the septum I have found only once in connection with chronic catarrh several crestlike, thick, tough tumors opposite the anterior end of the inferior turbinated bone.

The posterior ends of the turbinated bones appear in the rhinoscope light gray, rough, and swollen, especially those of the inferior turbinated bones, which often project out of the choanes, resting upon the uvula, and sometimes cover a part of the Eustachian orifice. They touch each other in front of the septum, leaving only the superior part of it open to view. In one case, the first I treated, the posterior ends of the inferior turbinated bones were changed into gray tumors, nearly as thick as a thumb. Sometimes also the septum is found to be swollen, rugged, and whitish-gray.

In the great majority of cases, the nasal floor was found smooth and healthy. But now and then half round elevations were found at the anterior entrance of the cavity.

All these changes may be found in one nasal cavity in a degree corresponding to the degree of the affection, or only the inferior or the middle turbinated bones, or only the posterior ends on one or both sides are changed. The widest cavities as a rule are most extensively diseased. Where bone-projections from the septum, or incurvations of it obstruct the cavity, extended swelling cannot take place, as on this account a wide-spread thickening of the mucous membrane, the sub-mucous and glandular tissue, is checked posteriorly.

Sometimes the obstructed side is found to be quite healthy, or only the posterior ends of the turbinated bones are diseased in a small degree.

In several cases the septum was the principal seat of chronic catarrh. The turbinated bones were found to be in a more or less normal condition. But the septum was very extensively roughened and granulated. In narrow nares a considerable obstruction may be brought about through irritation or swelling of the septum.

In one case (the patient a boy eight years old) I found on both sides of the septum on the anterior part, opposite the ends of the inferior turbinated bones, granulations high enough to be removed with the loop. Some elevations were also found on the anterior part of the left inferior turbinated bone. After the

operation a white-yellow, deep spot, somewhat rough—the bare cartilage—was to be noticed on the septum.

In five other cases I saw the septum perforated three times on the boundary between the cartilaginous and the bony part of it close to the nasal floor. At first the opening, about  $\frac{3}{4}$  to 1 cm. in dimension, was hidden from the eye by the granulations. Evidently a chondritis or a perichondritis was lying at the bottom of these excesses.

In many cases chronic catarrh of the pharynx, or hypertrophy of the palatal or pharyngeal tonsils was also present, or some small soft polyps on the middle turbinated bone.

#### TREATMENT.

It is a well known fact, that therapeutic remedies have been hitherto quite powerless against chronic catarrh. In the estimation of many laymen chronic catarrh is still incurable. *Niemeyer* says: "Chronic catarrh of the nares is a very obstinate disease, which not seldom mocks at every treatment, and often lasts with changing intensity for many years."

In the nasal douche of *Weber* a remedy giving the best results was thought to have been found against the diseases of the nasal cavity. But the expectations have not been realized. *Lucae* expresses himself pertinently on this subject in an article "On a new connection between nasal and ear diseases."\* He says: "If I speak of healing, I mean of course only, that I have by this treatment (nasal douche) succeeded in a short time—through a diminution of the secretion and a reduction of the swelling, in removing the complete obstruction of the nares, and thus also cured the affection of the ear, resulting from it. But in saying this, I am not to be understood to mean, that chronic catarrh itself was completely removed in this time (the time of a few weeks). For it is well known, that the several remedies, including the douche of *Weber*, are often without avail."

Where only hyperæmia or simple swelling of the mucous membrane subsists, where chronic catarrh is still of late date and cannot really as yet be called chronic, one may perhaps succeed with the nasal douche, or the syringe, which I prefer (see ozæna), in perfecting a cure. And this too, according to my experience in a few weeks, if in the morning and in the evening a liter of

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\* *Archiv fuer Ohrenheilkunde*, IV Band, iii Heft, 1869.

water is forced through the nares, in which one to two tablespoons full of chlorate of potassium has been dissolved. But insufflations of nitrate of silver 1: 10-8-6 parts of talc., act much quicker, and they are applied alternately one day anteriorly, the other day from through the mouth. Skillful persons can accomplish this themselves by means of the bent pipette. On the concave surface of the inferior turbinated bone some cauterization may be done with nitrate of silver in substance in order to accelerate healing, when the mucous membrane is spongy and swollen.

*Schroetter* reports,\* that he has cured old catarrh (*Stockschnupfen*) in one to two months. He applies cauterization with nitrate of silver in substance, which has already been recommended by *Niemeyer*. He (*Schroetter*) says, that with his covered caustic-holder he very easily succeeds in covering the involved turbinated bones, as also the septum with a white scurf for a larger or smaller distance. But first of all it is to be noticed, that the caustic-holder, being straight—not knee-formed—cannot be used under the guidance of the eye, with the speculum, which *Schroetter* does not seem to use at all. But in most cases the mucous membrane of the nasal cavity is only diseased in spots, as has already been described. (On wide-spread affections see page 32.) But the more the healthy mucous membrane is touched by the cauterization on the middle turbinated bone, the more intense headache ensues; or if on the inferior, toothache follows. The patients are sometimes affected so much, that they have to be in bed for hours.

After every cauterization the posterior ends of the turbinated bones are much smaller, if the caustic has been well applied. But on the next day they are swollen again.

In the first cases, which were treated by me, I had to apply very many cauterizations—in part with the aid of the rhinoscope, as only the posterior ends of the turbinated bones were affected—before the nares remained open and a cure was perfected.

Since I have become familiar with the galvano-cautery, I have found it a remedy by which every chronic catarrh can be surely and entirely cured in a few operations and with much less pain.

I have therefore since then wholly dispensed with cauterization in such cases; but I believe, without having tried it, that lunar-caustic alone, without being accompanied by other remedies, will

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\* *Laryngologische Mittheilungen* of 1870, 1871 and 1872.

not suffice to cure old hypertrophy of the mucous membrane, and such tumors as are described in the following pages.

At first I confined myself chiefly to the use of the galvano-cautery alone, but soon I learned that this treatment was too slow in cases of much swelling on the inferior turbinated bone. I therefore continued to shorten it much by the use of the loop-ecraseur.

The loop is arranged squarely and made about 1 cm. wide, conducted over the nasal floor, under the turbinated bone, pushed up until a solid resistance—the bony frame—prevents its going further; then the loop is drawn together. If the person is spanæmic or young, not more than fifteen years old, the current can work uninterruptedly, the loop being at the same time drawn together closer. After a few seconds a tumor about 1 to 1½ cm. long and also as thick, is seen hanging in the loop. In most cases it has precisely the appearance of a pale red raspberry, and consists of soft kernels, which can be pushed widely apart. After it has been lying in spirits for a time, it has the appearance of a caterpillar. Spread out, it appears lined with furrows crosswise. Once I removed a tumor, consisting of six flat berries, of the size of a pea, put together like a bunch of grapes.

The surface of the wound is smooth and of compact consistence. The pain, which is moderate, ceases immediately after the removal of the instrument. The hemorrhage is also small, and soon stops either by itself, or after about a liter of cold water has been forced through and upon the nose with the syringe. (See *ozæna*.)

As the swelling of the anterior end of the turbinated bone is removed, and the inferior meatus anteriorly opened, the tumors, which are still present and which are generally largest as we come into the posterior part of the nares, can now be seen easily, and under complete guidance of the eye, they can be removed with the loop.

If the patient is plethoric, it is better to take a thicker wire (No. 2 or 3) to check the current several times, especially after a fresh filling of the batteries, in order to separate the parts more slowly. This is done to prevent copious hemorrhage, which, although it can soon be checked in the above described manner, is nevertheless very inconvenient and time-taking. (On the concave surface of the inferior turbinated bone a narrow blood canal runs longitudinally.—*Luschka*).

Great care must be taken in this, that the tubes, which soon get hot, are kept free in the cavity and touch nowhere, or else the healthy parts, especially at the entrance, will be burned—which will make the otherwise very painless operation, as long as it is confined to the diseased parts,—a very irritating one, and cause much pain not only during but also long after the operation.

I generally remove but three or four pieces at one sitting. If two large pieces have been removed, I do not attempt to remove any more; partly because the patients feel somewhat indisposed (affected in their heads), while the cavity is often obstructed in a measure by blood and swelling of its walls, and partly because I desire to avoid a too strong reaction.

I have therefore never seen any bad consequences from the operation. Only a few patients have been on the next or second day after the operation taken with fever, dull headache, and restless sleep in a mild degree. It is therefore advisable, to make the first sitting short, in order to see first, whether the patient is especially irritable and sensitive or not,—that is, whether he endures the operation well. Generally patients are able directly to go about their business,—always going home on the same day, if they have come from a distance,—and manage the after-treatment themselves, by injecting every morning and evening a liter of water, containing a solution of chlorate of potassium, into the nares, in order to remove the mucus, which accumulates in large quantities. Moreover I give them this advice, that if fever, pressure in the head, or general indisposition should ensue, to keep quiet, abstain from work, eat but little, drink a glass of mineral water (*Bitterwasser*), and if necessary apply a cold poultice to the face and forehead for a few hours.

The continuance of the operation depends somewhat on how much has been done at the first sitting, and how the patient has borne it. Operative procedure may be resumed on the third, fourth, fifth or tenth day. Inflammatory swelling must have disappeared in order that the diseased parts can be distinguished from the healthy, so that the latter shall not be also removed by the loop.

In every consecutive operation the inferior meatus will be seen more open, unless a new acute catarrh interferes and it has been neglected to tell the patient not to come in such a case, as the nares will be too much obstructed and hyperæmic. In the second

or fourth sitting the posterior end of the turbinated bone will be seen anteriorly.

But here, on the posterior ends of the inferior turbinated bones, where the parts are more vascular, the loop must be made to glow very slowly, by a frequent interruption of the current, in order to prevent a copious hemorrhage. Or the galvano-cautery is to be applied instead. The galvano-cautery has a broad, thin armature of platinum, formed like the plate of a knife. The tubes run parallel, at the sides of each other, and are bent knee-formed. When first applied to the concerned spot, it must be cold; and again after it has been glowing for a few moments, it may be somewhat cooled off by checking the current. Through hissing and bubbling the cavity is densely filled with steam, which the patient can remove by a sudden, strong expiration through the nares, thus making it light again. He feels no pain until the plate reaches the healthy parts. As the pain increases and becomes more unbearable, he says, "stop!" and the operation is finished at this spot.

In this way I always destroy the rugged elevations on the convex surface of the inferior turbinated bone. The burner is pushed through between the septum and turbinated bone, and pressed against the latter; then the current is let on until the patient reports that pain is coming. With the rhinoscope it can now be more definitely ascertained how much still remains to be done, and whether the burner must be brought further up toward the exterior part of the surface.

The more plethoric the individual, the more frequently the current has to be checked. With the loop arranged horizontally, I remove only thin tumors from the posterior ends of the inferior turbinated bones, especially when the patients are anæmic. I am also careful in such cases to push the loop only a very little toward the exterior, i. e., toward the side wall, for fear that not only hypertrophied mucous membrane, &c., but even a part of the end of the turbinated bone itself might be pressed into it, and thus, not only a copious hemorrhage, but also other even more serious accidents might be caused thereby. This is to be feared so much the more, as there is an abundance of nerves on this spot, and the space between it and the openings of the Eustachian tubes is very small indeed.

If there are bone-projections from the septum, or incurvations of it in the way of operating on the posterior end of the turbinated



bone, then I generally conduct the instrument, which is strongly bent towards the front, through the mouth, with the aid of the rhinoscope, to the tumor on the turbinated bone. However, as one can only succeed in this where there is considerable space, he may be obliged to have recourse to the following treatment.

In the first place the burner (with the tubes running by the side of each other) is pushed through the inferior or middle meatus into the pharyngeal vault. Then by the aid of the rhinoscope, it is applied to the tumor, to which it is closely pressed and held there by the right hand, whilst the left lays aside the mirror. The handle, which had been removed, is now applied to the ends of the conducting wires, and by interruptions heat is produced. Soon the platinum will cleave to the tumor, and can now lie there for a time. It must be removed very slowly and carefully, if we desire to avoid hemorrhage. Caution of course demands a very prudent management, with the aid of the rhinoscope in the application of this method, which *Voltolini* also applied in the pharyngeal vault. After the inferior turbinated bone has been completely cleaned, it often appears larger, and springs in a wide arch from the side wall. It now presents a broad concave surface, which can be inspected from the anterior to the posterior.

*The middle turbinated bone* is treated by drawing shallow lines over the surface of the spongy mucous membrane with the burner. As before, the sensation of the patient furnishes the best guide. But if the swelling has anywhere grown into a somewhat defined tumor, a small mucous polyp, which is most frequently the case on the anterior end, then the loop of course will be most serviceable.

In some cases the tumefaction on the middle turbinated bone has not yet arrived at this stage, where it can be removed with the loop. Then the galvano-cautery has to be used from the beginning. It is slowly pushed through under the turbinated bone to the posterior end; then it is pressed somewhat upward, when the current is let on and the instrument is slowly drawn out. In this way the galvano-cautery is two or three times successively drawn over the concave surface.

But in these cases a treatment with bluestone in substance is best adapted. The end of the knee-formed probe is dipped into melted bluestone, which is then rubbed over the inferior surface of the turbinated bone. If this is done with caution and the healthy spots are carefully avoided, especially on the septum and



the turbinated bone, then the patient feels but very little pain. But some sneezing and more or less watery secretion will follow.

The cauterization can take place two or three times a week, no matter whether the concerned parts are not quite healed as yet, but still yellow, in a state of inflammation. It must be done from ten to twelve times, whilst the galvano-cautery has only to be applied two or three times in intervals of from ten to twelve days.

The cure is recognized by the fact, that the copious mucopurulent secretion has ceased and the obstruction is completely removed. Inspection shows, that the meatuses are open, that the mucous membrane is smooth and adheres closely all over.

In the rhinoscope it is to be seen, that the ends of the turbinated bones are within the choanes, and do neither touch one another nor the septum.

A few cases came to my notice which were accompanied by *real spasms of sneezing*. The patients complained of having to sneeze from twenty to fifty times, soon after leaving the bed in the morning, until they were quite exhausted, and watery secretion would copiously flow in connection with it.

In one of the cases I found the inferior turbinated bone lying close to the septum. The cavity was thus wholly obstructed and inspection thereby prevented as in acute catarrh.

The rhinoscope could not be employed on account of the great tendency to choking.

As the galvano-cautery had never yet failed me, I tried its merits also here. I gently conducted it under the turbinated bone into the pharyngeal vault. Then, making it hot, I slowly drew it out again. This slight cauterization I repeated two to three times.

After a few days of profuse yellow mucous secretion the nares were open and I could now see that the middle turbinated bones were entirely normal and that the inferior ones were healthy up to the posterior part. Here were scattered around the free border and the concave surface a number of light, smooth kernel-like tumors having the size of a pea.

They were the cause of the daily spasms of sneezing, for after they had been destroyed (in about five sittings), these phenomena were completely stopped. After about one and a half years a small relapse had ensued, which was however removed by the same means.

With another patient, H. G., of Duisburg, with equally tor-

turing spasms of sneezing, which immediately followed on his getting out of bed and placing his feet on the floor, the nares were entirely open and healthy. On the anterior ends of the middle turbinated bones there were about a dozen such kernel-shaped tumors. Some of them being rather more than little mucous polyps.

On the next day after the first operation, the sneezing was not so violent, and after the second, it disappeared entirely.

After about a year's time a weak relapse, a few little tumors had again appeared, against which the galvano-cautery was applied but once. As to the question when he should come again, the patient was answered, that he must come as soon as tickling or sneezing returned again. A year and a half has since elapsed, but I have not heard from him, no doubt because the affection has not returned.

Another case was that of a lady of about thirty-six years of age. Her nervous condition would easily lead one to think that the spasms of sneezing were hysteric. After the little polyps, which were on the anterior end of the left middle turbinated bone, had been removed, the spasms did not return.

But the condition just described, can also be caused by chronic inflammation, or a swelling of the mucous membrane on the anterior end of the septum, which is then found to be wrinkled and spongy.

Once I found *the entire mucous membrane of the nasal cavity seriously affected*. The patient was a lady, thirty-six years old. She had been afflicted with chronic catarrh ever since she was a child. At first sight I thought that the red tumor at the entrance of the left nares—quite granular on its surface—was of independent growth. But with the probe I found that the lining (*Bekleidung*—i. e., the mucous membrane) on the anterior end of the middle turbinated bone was thus much affected. In the right nares at the same place was a similar tumor, only somewhat smaller.

With the rhinoscope I found, that the choanes were much diminished in size. The ends of the turbinated bones projected out of them as grayish-white uneven rolls as thick as a finger. The septum in its entire height was changed into a thick, pale, rugged bunch.

In the course of treatment the entire mucous membrane, with the exception of the floor, was found to be much thickened, raised

up, covered with pointed rugged crests, which were too small to be removed with the loop.

Hence the galvano-cautery was applied. Sixteen operations were necessary, each lasting one-half to one and a half hours, to remove this extraordinary hypertrophy of mucous membrane, glands and sub-mucous tissue; to free the turbinated bones of their monstrous shape; to make the lining of the cavity smooth all over, and to bring about again a patulous condition of the nasal cavity through to the pharyngeal vault.

And thus not only all the difficulties against which help had been sought in vain, disappeared, but also the exterior cartilaginous nose was diminished in size by degrees. Its form became natural and the entire face received a more healthy and youthful appearance.

Thus chronic nasal catarrh of old date has its origin either in hypertrophy of the mucous membrane, tumefaction on the concave surface of the inferior turbinated bone, or on its posterior end (in which the sub-mucous tissue participates more or less), or the mucous membrane of the middle turbinated bone, becoming spongy, hypertrophied, or formation of polyps, beginning on the anterior end, free border or posterior end.

The septum is less often the seat of chronic catarrh in consequence of cartilaginous inflammation. Very seldom is a chronic inflammation or a swelling of the entire nasal mucous membrane the cause of chronic catarrh. The nasal floor almost never participates.

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### III. DEFORMITIES IN THE NASAL CAVITY.

Frequently persons have come to me, who complained of having chronic catarrh. But examination revealed the fact, that the obstruction was caused by a deformity of the walls of the nasal cavity.

Triangular projections are most frequently noticed on the bony septum: sometimes anteriorly, sometimes in the centre, or again on both sides of the free border. They have thin pointed ends, directed towards the inferior turbinated bone. Often they project freely into the meatus between the middle and inferior turbinated

bones. Sometimes a projection extends over a large part of the septum, as an oblique edge from below upwards, and from before backwards. Thick, triangular edge-like bone-projections are also often seen close to the nasal floor, extending for some distance, and seem to proceed from the *crista nasala* opposite the anterior end of the inferior turbinated bone.

An abnormality, which not very seldom occurs, is the angular bending in of the septum, by which on the one side a deep horizontal furrow is drawn along the entire wall. On the other side of the wall, the nasal cavity is obstructed in a high degree through the knee-formed projection of the wall into it. It is doubtful whether a blow on the nose, or a fall, could thus injure only the bony septum,—break it, and bring about a dislocation of the broken parts in this manner.

*The cartilaginous part of the septum* is more largely exposed to external violence, and can be more easily injured. Thus the very frequent deformities, which are noticed even exteriorly by the inclined position of the nose, may mostly have been brought about in this manner.

The anterior part of one side is often enlarged in this manner to the detriment of the other. And then, at times, when sudden strong inhalations are made, the air in the nares is quickly diluted and the exterior air presses the nasal wing against the convex side of the bent cartilage, and the entrance of air is thus hindered at a time when it is most needed.

At the entrance to the bony portion of the nares, a pale, moveable projection is sometimes found near the nasal floor. It is the inferior part of the cartilaginous septum, which has been disconnected from the bony one, and has been dislocated from the grove of the vomer.

This condition gives rise to the same disturbance of breathing. I also observed it once in a case of extraordinary thin and relaxed nasal wings.

The bone-projections at the anterior entrance I have repeatedly diminished, where it was desired, with the galvano-cautery to such a degree, that the entrance of air (breathing) was no longer much retarded.

Those cases, where evidently a partial luxation of the cartilaginous septum had taken place, were too old, to encourage one to a trial of bringing them back again into the grove of the bony septum. Where the cartilaginous septum in young persons was

bent, I advised them to press the cartilage daily from fifty to one hundred times toward the other side, so as to straighten it; and also to put on the nose-squeezer during the night, of which mention has been made in the catalogues. But as to the result I am not prepared to speak as yet.

*Deformities of the turbinated bones*, as has been already observed, are often brought about by projections from the septum. Sometimes the middle turbinated bone on the one side is of monstrous dimensions, while its mucous membrane, adhering very closely, shows that the bony structure gives it this shape. On the other side the turbinated bones are of smaller dimensions, while the cavity is obstructed by the septum projecting into it, the superior part of the septum especially being bent in. In ozæna the anterior end of the middle turbinated bone (i. e., its mucous membrane) is often found to have grown adherent to the septum.

In the normal condition there is but a small cleft between these. But in a condition of swelling they soon touch each other, which, if the *epithelium* is knocked off, easily gives rise to a growing together, by which they may be united in small spots or over a larger area. Thus no doubt the bridges of mucous membrane, so frequently observed between the turbinated bones and the septum, are brought about in this way. Three times I have seen tough strings, about  $\frac{1}{2}$  cm. wide, spread out between the anterior end of the inferior turbinated bone and the septum. Also once between the posterior end of the same and the septum. It could not be ascertained, whether they were congenital or acquired. One patient said, that the bridge, which he could feel with his index-finger, had formed after an operation on some polyps with forceps. These strings were cut through in a moment with the galvano-cautery, as they were in the way of operating, and then destroyed.

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#### IV. OZÆNA.

The Greek name "*ozaina*" has ever signified an odorous nose (*Stinknase*), an odorous ulcer in the nares. An indescribable offensive, sharp odor of the breath, and occasional obstruction by dried purulent secretion, are the most prominent symptoms.

When the obstruction is removed, yellow-green scales, large slices or thick gray or nut colored stopples, of cadaverous odor can be brought out, through the nares, or the mouth; which is

often however not accomplished without much useless chocking and blowing of the nose. On an average one succeeds in this about once in 2—3 days, and then only partially.

Until they have succeeded in this the patients often suffer vertigo and aching of the head. Often they also experience a painful pressure over the eyes; while the voice has a somewhat nasal tone.

The patients often complain of a dryness in the throat, a want of ease in swallowing. The sense of smell generally suffers, and may be entirely wanting.

Of the 85 cases observed by me, 44 were females. This ratio impugnes the opinion of *Voltolini*, that this sad disease was almost entirely confined to women.—The youngest was 7, the oldest 45—50 years of age.

With the older patients the phenomena were generally more moderate than with the younger. But all stated, that the affection had commenced (that they had known of it), when they were very young.

They themselves had been weakly, or came from parents, who were more or less diseased. Some of them had suffered with swelling of the lymphatic glands, inflammation of the eyes of long duration, and had shown a great tendency for contracting cold. The patients—even in cases of moderate degree—do not have a youthful, healthy appearance, corresponding to their real age; but appear sallow and unhealthy. On the forehead and around the eyes, signs of dissatisfaction are often noticed. In cases of a higher degree of severity the color of the face seems gray and yellow; and the features are pale and lax. The nose is often swollen in the cartilaginous part, but seldom reddened. The pale skin of the nasal root and glabella is often moderately swollen.

It is easily explained, why with some of the patients a feeling of oppression predominates; for they perceive, that their breath is avoided by everyone.

By means of the speculum the nares are found to be unusually large. In the posterior part the inferior and middle turbinated bones, the roof, the pharyngeal roof, and the posterior wall of the pharyngeal vault, which can be well illuminated, are seen to be covered with large scales of yellow-green color, or some glots of nut-color. On the middle turbinated bone a yellow, watery, cream-like mucus is generally observed; which also has a penetrating bad odor



The anterior part of the cavity is mostly free, unless the patient's avocation requires him to bend his head forward. (This fact is to be explained hereafter.) After the mass of mucus—which cleaves like mortar on the walls—has been loosened by means of the syringe, and blown out, or removed with the knee-formed forceps, it is observed, that the cavity is thus large, because the inferior turbinated bone is very narrow and thin; often running like a thin edge, about  $\frac{1}{4}$  cm. high, along the sidewall. Posteriorly it is often flattened out so thin, that its end is more like a part of a skeleton. It also appears shortened.

The inferior and middle meatus being in consequence conspicuously broad. The Eustachian orifice, and also the entire half of the pharyngeal vault, as determined by the respective choane, can thus be easily illuminated. The movements of the soft palate can also be well observed. The observations I have thus made, have been published in an article, bearing the following title: "The Relation of the Eustachian orifice to the soft palate, as observed on a living subject through the nares."

Anteriorly the middle turbinated bone is often for some distance adherent to the septum (has grown to it), or is only connected with it by bridges of mucous membrane. The superior turbinated bone and the whole nasal roof can be seen only in exceptional cases.

The mucous membrane adheres closely all over. Only on the anterior end of the middle turbinated bone it is sometimes moderately swollen. Sometimes, but not always, it has a rough, wrinkled appearance on the septum and middle turbinated bone, which is perhaps brought about through swelling of the glandulæ, and the knocking off of the epithelium. Some small elevations are also seen sometimes on the inferior turbinated bone; which often has a pale color; whilst the middle turbinated bone is generally more reddened. When the septum presents a velvety, uneven surface, hyperæmia is present. The intensively red color, which is seen immediately after the scales have been removed, on the spots, which they occupied, soon passes away. In some places, as for instance on the nasal floor, the mucous membrane has a shining, smooth, rose-red appearance.

But in not a solitary instance have I seen purulent defects of the mucous membrane in connection with this affection, and only in one case bone-necrosis; which has been reported in the case of



H., in an article : "New observations," etc. *Berlin Klin. Wochenschrift*. No. 41, 1875.

Among the 85 patients, treated by me, and suffering with ozæna, there were none affected with syphilis, or who had ever suffered with it. This discovery will show conclusively, the current opinion, hitherto held—namely that the principal cause of ozæna was to be found in a process of ulceration of the mucous membrane and the bones, from which this odorous secretion originated—to be erroneous. Cases, where such a process is present, must be very rare. I have not yet found any. In the convocation of naturalists (*Wisbaden*, 1873) I remarked, that according to my observation, no ulcers were to be found in connection with ozæna; that the scales had always been taken as such by mistake.

The unanimous contradiction met with then, would no doubt not be offered again. For not only have my views, as then expressed, been confirmed by a great number of cases, observed by myself since that time, but also by *Professor Zaufal*; who says, that he has found no ulcers in about 20 cases, which he has examined. He also thinks, that where ulcers had been diagnosed, it was done by mistake.

I found the affection always on both sides, except in one case. The patient was a man 45 years of age, who had always been weak, and had suffered much with cough and expectoration. He had been afflicted with this loathsome malady from childhood. The septum was bent to the left. The inferior turbinated bone was very small—lying along the sidewall like a small edge. For the first time I found here the middle turbinated bone almost gone. Only the third part of it, toward the posterior end, could yet be distinguished. The entire roof was bare, as also the anterior wall of the sphenoid cavity, which had an opening on the right.

The left nares was very much obstructed by the convex septum projecting into it. The inferior and middle turbinated bones were completely normal. The mucous membrane somewhat wrinkled, and uneven. But there were no scales and no odoriferous mucus present.

His child, 8 years old, had already suffered with ozæna for about three years and a half. The cavities of the child's nose were very wide; the turbinated bones having their normal form, but small.

## DISCUSSION OF THE SYMPTOMS.

In looking at the secretion, one finds, that it has a yellow-green appearance. Often some plugs of pasty consistence, dirty gray color, and horrible odor are taken out. The liquid secretion is yellowish-white, purulent, opaque; sometimes aerated. It cleaves very tenaciously, and has a sharply unpleasant odor.

The first question, to be asked, is: *Where does this mass of purulent mucus originate?*

The glands of the nasal mucous membrane have the form of grapes. According to *Luschka* the mucous membrane is  $1\frac{1}{3}$ —3 mm. thick. In the olfactory region (*regio olfactoria*) the glands are smaller, but are strongly drawn out in their length. To this region the greatest part of the septum belongs, as also the superior part of the nasal cavity, reaching to the border of the middle turbinated bone. In the respiratory region (*regio respiratoria*), which is formed by the middle and inferior meatus, and which is the broadest part of the cavity, the glands are much larger, and are present in great number.—*Luschka*.

The mucous membrane of the nasal cavity presents an extensive surface, and is well adapted to produce large masses of mucus. In ozæna we see the mucous membrane affected only in a very slight degree. The scales may irritate and incite the healthy parts of it to increased secretion; but it is not swollen, spongy, and thickened, as it is found to be, after it has been for years in a state of chronic inflammation. It adheres closely to its underlayer; it is not in a state of hypertrophy. For the most part it is smooth, shining on its surface, and in some places not even reddened. Its condition does not at all correspond to the quality and quantity of the extraordinary nasal mucus produced. Moreover it is to be noted, that the inferior turbinated bone, the part, which has the greatest quantity of blood, and which constitutes the greatest part of the respiratory region, is found to be in a state of atrophy. While—there can be no doubt—that, as it passes away, a great number of mucous glands are destroyed also.

But the facts, through which I was first led, to look for the main source of secretion—not in the principal nasal cavities—but somewhere else, are as follows: After the mucous membrane had all over resumed its normal condition—had a normal appearance—in consequence of the treatment instituted; there was nevertheless a yellow liquid mucus found daily in the pocket-handkerchiefs

of the patients; and some scales were also noticed in the water, used for injection. Again, if the syringe had not been used, and if no injections had been made for a few days, the posterior ends of the middle and inferior turbinated bones, the septum, and the head of the pharynx were again seen to be covered more or less with a layer of dried secretion and scales.

On the posterior end of the inferior turbinated bone, I had often noticed a yellow covering, having the appearance of an ulcer. But after injections had been used (for which often 1—2 liter of water were used, on account of the adhesive character of the cream-like fluid secretion), the mucous membrane appeared again clean and pale-red, even where the scales had been. The most minute inspection, with sun- and calcium-light, could find neither ulceration, nor inflammation. It was found to be neither rough nor swollen.

I was therefore forced to conclude, that the purulent mucus came from one of the side-cavities of the nasal cavity.

The largest one is the cavity of *Higmore*; the opening of which is in the middle meatus, somewhat below the centre of the middle turbinated bone, on the sidewall of the nasal cavity. On this spot I have never seen any mucus or scales anywhere as a rule on the surface of the inferior turbinated bone below this opening.

Aside from this it is to be noted, that the opening of this cavity is about 3 cm. above the floor of the same. A discharge could therefore not take place until the cavity was thus far filled with mucus. But all the symptoms—such as toothache, swelling and reddening of the face, which would necessarily be connected with the filling up of so large a cavity with purulent mucus, are entirely wanting in ozæna. It seems to me therefore, that the maxillary cavities as a rule are not concerned in ozæna.

*The frontal sinuses* have their openings under the anterior ends of the middle turbinated bones. But in the anterior part of the nares on the sidewall, or anywhere else, scales are very seldom found; and as it can not be possible, that this very tenacious mucus could flow off posteriorly—in consequence of the decided sloping—without leaving a trace behind, by which its source could be discovered. And as also a yellow mucus is very seldom found flowing below the inferior turbinated bone, I believe, I can offer the following proposition: viz., that, as a rule, the

frontal sinuses are not at all, or not conspicuously affected in connection with the malady under consideration.

Perhaps in cases, where a swelling is noticed on the skin over the nasal root, or on the glabella, they may be more concerned; but I have never as yet paid any particular attention to their connection.—I have studied these parts on about 25 skulls, a part of which were macerated, while the others had been preserved in spirits.

*As to the cavities of the septum*, I found large openings upon the posterior ends of the middle turbinated bone. 1, 2, or 3 through which the probe passed into the posterior and central cells of it. A hole over the centre of the free border, through which the probe entered into the anterior cell, was not so large.

*The opening of the sphenoidal cavity* was in every case seen to be 1—2 cm. above the border of the choane, and opposite the posterior end of the middle turbinated bone. There was but one opening, and this mostly on the left side; never at the bottom of the cavity, but always on its roof

The discharge of mucus is hindered thereby, but it is accelerated by bending the head forward. It is further aided by the circumstance, that the lining (*Bekleidung*—here its mucous membrane) of the cavity, when in a state of inflammation, is swollen; and thus the bottom of it is brought nearer the cleft-like or round opening.

The openings of the cells of the septum were all found low down at the bottom. These cavities are the largest next to those of the maxillary.

If mucus is discharged from the cavities just spoken of—the septum and the sphenoidal cavities—while the head is in the ordinary position, then the mucus thus discharged, must run to the posterior end of the middle turbinated bone, whence it drops down to the inferior turbinated bone, the nasal floor, and the soft palate. If the patient is lying on his back, it covers especially the pharyngeal roof; lying on his side, the septum. Repeatedly I saw, in cases of ozæna, in patients with very wide cavities, a yellow plug hanging out of the opening of the sphenoidal cavity on the left side.

Therefore the reasons I have for believing, that ozæna chiefly consists in purulent inflammation of the side-cavities especially those of the septum and the sphenoid bone, are now, in short, given as follows:

1. The inadequate pathological proof in the nasal cavity.
2. The manner in which the secretion spreads in the posterior part of the cavity and on the pharyngeal roof; and its appearance there even after the nasal cavity has been healed.
3. The intense odor of the purulent secretion even in its semifluid condition, showing that it comes from a cavity favorable to its decomposition. For mucus, which is produced on an open, free surface, does not give an offensive odor.
4. The extraordinary obstinacy of the disease, which could not exist, if the mucous membrane of the nares was the cause of it; because in ozœna the mucous membrane of the nares is especially easy to be treated throughout its extent.

It might be supposed, that not only the membranous lining of these cavities was chronically inflamed, but that also bone-necrosis was present. There may be indeed some little straps of bone, dividing the cavities into pigeonhole-like partitions, which do also perish. But an extended bone-necrosis, on the superior wall for instance, would cause brain-phenomena; and on the exterior wall of the cavities of the septum it would cause disturbance of sight to a greater or lesser degree. But all these phenomena are generally wanting in ozœna.

But the decisive word will have to be spoken by pathological-anatomical investigation. Yet I confidently hope to see my observations confirmed in every essential point.

The complaint sometimes made, of pressure over the eyes, of dizzines, of heavy dull headache, might without difficulty find an explanation in the fact, that the cavities, in consequence of an obstruction to their openings, are filled to excess.

The second prominent symptom of the disease under consideration is, the bad odor.

It originates in this, namely, that the purulent mucus, already odorous in its semifluid, i. e. relatively fresh condition, is subject to further decomposition, as the nasal cavity can be but insufficiently emptied by the blowing of the nose. The secretion has therefore to remain in it for days, thus accumulating in large masses.

The proof, that the bad odor is thus brought about, and not otherwise, is to be found in the fact, that it passes away, as soon as the cavity is completely cleaned by methodical injections; and that it also stays away as long as the removal of the exudation is regularly performed.



Why the secretion can not be removed by simply blowing the nose, without the aid of injections, is partly owing to its adhesive nature; but more than this to the circumstance, that the nasal cavity is very much enlarged, and the air, forced through it, has more of a chance to pass by—to escape. *Zaufal* believes, that the abnormal enlargement of the cavity is brought about by a rudimentary growth of the inferior turbinated bone. And that in consequence of the stagnation of the secretion putrefaction takes place; that ozæna is not so much a disease *sui generis*, as a symptom of stagnated or putrefied secretion in the nares.

My view of the nature of ozæna I have tried to substantiate above, and here I would only add, that to me the diminutive size of the inferior turbinated bone seems to be less an hereditary phenomenon than a consequence of the disease.

According to *Kohlrausch* the veins of the inferior turbinated bone consist in a really cavernous network (*Netzwerk*), which extends as a layer about 4 mm. thick, between the *periosteum* and the mucous membrane. (*Luschka*.—"Anat. of the Head.")

This vascular submucous tissue is either entirely wanting, or substantially reduced in ozæna patients. For the inferior turbinated bone feels hard, and is not at all or but very little elastic, according to the degree of atrophy. It has lost its faculty to swell. It does not swell after cauterization, nor are ozæna patients subject to acute catarrh, after having contracted cold, or a complete obstruction of the nares like healthy persons.

My theory of the process is as follows: Originally the patient as a child was subject to a more or less violent catarrh of the nasal cavity and its side-cavities. But as his constitution was weak, lax and scrofulous, the tendency to overcome the affection was not sufficiently strong, and it therefore remained. In consequence of this chronic catarrh, which was often acutely aggravated—an expansion of the submucous tissue—ensued, and the subsequent contraction of it brought about an erosion of the submucous vascular tissue.

The sallow appearance of ozæna patients may be brought about by the loss of so much purulent secretion, containing albumen; and the infection of the air inhaled through the nares.

Sometimes, no doubt, the appetite is also diminished on account of the feeling of nausea, brought about by the mucus cleaving to the posterior surface of the soft palate and the pharyngeal vault.

The mucus, by being swallowed, may also produce stomach-catarrh.

*Dryness in the throat* is in many cases described as very troublesome. In examining the throat, the posterior wall is found dry, smooth and shining, as if it were covered with a thin transparent cover of varnish. But the mucous membrane is not thickened, swollen, roughened, or reddened; but on the contrary is found to be pale and thin. The posterior surface of the uvula also has a dry appearance. This condition has been described as "dry catarrh", but I have never found it in connection with healthy nares, and do not look at it as an independent form of throat-disease, but as an affection, which is very often found in connection with ozæna.

With other patients, having their nares obstructed in a great degree—which is very seldom the case in connection with ozæna, and then only for a short time—by polyps, chronic catarrh, or hypertrophy of the pharyngeal tonsil, and who were obliged to breathe through the mouth exclusively, I have never found this wall dry. They only complained of dryness in the throat after fast running, or during the night, after they had slept for several hours.

The obstruction of the nares then can not be the cause—at least not the main cause—of this phenomenon; nor is it to be supposed, that the mucus found here (on the walls of the pharynx) comes down from out of the nares. For it is not purulent, yellow, but light-gray and transparent, covering the walls like an even layer of glue. The facts in the case seem to me to be these: The normal watery mucus is secreted in very small quantities; hence, as soon as it has come out of the glands to the surface it dries. Thus we find the cause in a defective action of the mucous glands.

Below the region of the root of the tongue the wall is moist, evidently because in swallowing, it is constantly besmeared by the tongue, and also on the pharyngeal roof, and the superior part of the posterior wall, because the great number of glands aid the pharyngeal tonsil in as far as it has not also been subject to atrophy. I look at this dryness or defective, insufficient action of the mucous glands as a result of the atrophied state of the pharyngeal mucous membrane. And I am strengthened in this belief by the observation already made, viz., that I have never found hypertrophy in connection with ozæna, either of the uvula, the palatal



tonsils, or the mucous membrane and pharyngeal glands (chronic pharyngeal catarrh), or the pharyngeal tonsil.

As to the trouble in swallowing—dysphagia—it is, no doubt, caused by the dryness, as also by an accumulation of the secretion, and crust formation on the posterior surface of the uvula and the posterior pharyngeal wall. Some patients complain especially of dysphagia, and of a sensation as if a foreign body was in the throat, &c. They complain of obstruction by mucus (*Verschleimung*) in the throat. And as the mucus is loosened through the acts of mastication and swallowing—they complain, that thick knots of yellow-green mucus often fall down into the throat from above, while they are taking their meals.

They generally point to the region of the hyoid bone to show the seat of affection. Not a few have in consequence of this been treated by different physicians for throat disease. They were astonished to learn that their throat was perfectly healthy; but that instead their nares were diseased.

Finally there remains for discussion *the partial or entire loss of smell*. According to *Vierordt* there are branches of the olfactory nerve on both sides reaching through holes of the septum into the nasal cavity, distributed in a double row. The exterior row spreads on the interior wall of the labyrinth of the vomer and the superior and middle turbinated bone. The interior row spreads on the superior and anterior part of the nasal septum. Thus the exterior row in part spreads over a region, which is covered with a thick and chronically inflamed mucous membrane. This fact alone explains sufficiently, why the ends or the nerves can not be reached, can not be touched by odor, the specific means of their irritation.

The taste was never found to be diminished in a perceptible degree. Nor was it but seldom found that an ozæna patient suffered at the same time with deafness. Progressive hard hearing was found in one case. In several cases I found purulent inflammation of the tympanum in connection with ozæna.

#### TREATMENT.

The first thing in order is to get rid of the bad odor, to remove the secretion.

The nasal douche does not suffice for this, as I have had a chance to learn from a great number of patients who had in vain used salt water, solution of alum, &c., for a long time.

A complete cleaning can be perfected by means of the syringe, which I would especially recommend; it can be bought of the trussmakers, where it is known as "the english spray" (*englische Spritze*). It consists of a bulb with a valve-like apparatus in its interior; has a tube on each of its ends, about  $1\frac{1}{2}$  to 2 feet in length.

One end, made heavy by means of lead, is put into a vessel, containing water; the other end, the tube of which is a little longer, and has a little pipe of horn attached, is pushed into the nares. Then it is brought into a horizontal position and gently laid to the septum. After the air has been removed, by a few compressions of the bulb, and it has been filled with water, the full bulb, held in the hand, is about half emptied by a short compression; then a pause ensues to let the water flow out of the other nares. An uninterrupted pumping—forcing of water into the nares and the pharyngeal vault—calls for an incessant straining of the uvula (*lavater palati*), in order to keep the mouth shut off from the pharyngeal vault. If its strength fails only for one moment, the openings of the Eustachian tubes, which are closed by the raised uvula, become freely open, and thus the water would have free access to the tympanum, and much pain and even inflammation might ensue.

An act of swallowing, whilst the nasal cavity is full of water also very much aids the water in entering the tympanum (*Mittelohr*). As I have observed in my mirror-pictures, that in swallowing the Eustachian orifices are widely opened.

A sudden pressing out of the entire bulb of the syringe then, is, aside from the violent, painful dashing of the water against the walls, also inadmissible for the reason, that the water, not being able to flow off fast enough, and therefore, under strong pressure in the pharyngeal vault, might overcome the strength of the parts, which close the Eustachian tubes, and thus enter forcibly the tympanum. Some few patients came to me and complained of having had pain in one or the other ear during the time of or after the injections. But when I requested them to show me how they had used the syringe, I learned, that they had emptied the bulb too suddenly and too strongly. They had not followed my instructions.

The syringe has the following merits over the nasal douche:

1. The force required to drive the water into the nares, can easily be determined by the feeling of the hand, and by a little

shifting now and then, whereby the point of the tube is directed to a different part of the wall, the cavity can be easily and surely cleaned; however tenaciously the scales and the mucus, still in a liquid condition, may cling.

2. On a journey, or away from home, it can be used without attracting much attention. On the contrary the nasal douche has the following disadvantages: *First*, It provides too weak a stream, it only softens, but does not carry off; on which account it requires much more time, unless the sticky secretion is to be removed only in part; *Second*, Its application is more difficult, because two vessels are required, and one of them must stand in an elevated position.

Those, who have used the nasal douche for months without any result, are best able to acknowledge the merits and reliability of the syringe.

According to the degree of affection and the mass of mucus accumulated, 1, 2 or 3 liters of water is forced through the nares in the morning and evening, sometimes also in the afternoon. In winter the water is made warm; in summer this is not necessary.

If after this syringing the nares are completely open, respiration unobstructed; the palate feeling free; and the air, expired through the nares, devoid of odor—it is evident, that the cavity is well cleaned.

Now the cleaning of the side-cavities will be taken up.

If a larger quantity of water is thrown into the nares, than happens by half emptying the bulb, then one may see a stream of water coming out of the other nares immediately after. Then a little pause ensues, when again as much more water comes out as at the first time. As soon as the first water has flowed off, the patient lets the point of the tube in his nares slip out and shuts up both nares with his thumb and indexfinger, at the same time bending his head strongly forward, and keeping it down quite low for a few minutes. Thereby the water is forced to enter the side-cavities—the openings of which have been freed of mucus—especially the cavities of the sphenoid and the septum. A painful feeling in the head above the eyes, and the slow dropping down of water from the nares shows, that this has taken place.

I add to the water 1, 2 or 3 tablespoons full of chlorate of potassium, which has previously been dissolved in hot water.

The roughened, wrinkled spots on the inferior and middle turbinated bones I cauterize once a week with the galvano-

cautery, or with nitrate of silver, or with *potassium causticum* in substance. The galvano-cautery has to be applied very slightly, as no hypertrophied submucous vascular tissue is present. An incautious application therefore might instantly cause violent toothache. On the septum, as in the nares in general, I deem it advisable to cauterize only in spots, because otherwise it causes very easily too much and too severe pain and affection in the head. The bluestone-wire must also be applied lightly and superficially, especially on the anterior part of the septum, to prevent a tearing of vessels or other serious consequences. In one of the first cases, treated by me, a very disagreeable accident happened after cauterization on this spot.

Formerly I prescribed and tried insufflations of nitrate of silver, sulphate of zinc (1: 10: 5), of pure creosote-powder, of *flores sulph.*, of *chinin sulph.*, in solution, of *alumen acid*, etc., as long as I supposed the principal seat of ozæna to be in the main part of the nares, and there only.

Lately, for the reason given above, I have more and more abandoned this treatment, and have relied chiefly on a correct, conscientious and cautious use of the syringe.

The results of this treatment are as follows :

In the first place the penetrating odor is entirely removed by complete cleansing—a result, which is of great importance to the patient.

After a few weeks the secretion diminishes; it becomes clearer and more watery, as can be seen in the water used for injection. If one sees the patients again after 2—3 months, he is astonished to notice, how much they have changed in appearance. The morose, vexatious countenance, the aged, sallow appearance have passed away. The complexion is clear, the face full and round, the cheeks round, which again gives them a youthful appearance, corresponding to their age; they feel clear and free in the head, more comfortable, stronger, and healthier. As the patients can manage the treatment chiefly themselves, the greater number of them are soon lost sight of. But in about 25 of the whole number, treated by me, who were adults with very extensive ozæna, I have made observations for from 1 to 5 years, by having them come to me every 2 to 6 months. Some of them could dispense with the injections for 8 to 10 days without the formation of scales, and bad odor resulting again. But the majority had to use the syringe

daily or every other day, whereby sometimes a few yellow scales, or thin small crusts were found, but at other times none at all.

The sense of smell is also often improved.

The injection causes no trouble, is accomplished in a few minutes, and to those, who have always been accustomed to cleanliness, it soon becomes a necessity, as much as the cleaning of the teeth.

Well may I say, that I have merited a feeling of gratitude from many a patient by my method of controlling a disease, the ugliness of which has even at this time given cause for divorce. But as yet I have not been able to see a real cure perfected.

By a real cure I mean an entire and a lasting cessation of the yellow, odorous mucus-secretion, and an exclusive production of clear watery normal nasal mucus.

The cause of its obstinacy evidently lies in the fact, that the involved side-cavities can not be reached by strong cauterizations; that only such persons are affected with the disease—the lax vascular tissue of whom tends to a slow degeneration, and who have a scrofulous diathesis. By a removal of the middle turbinated bone the cavities of the septum would become more accessible. But a patient may not easily be found, who is willing to have this experiment tried on him.

What has been said and written heretofore about a complete cure of ozæna, I must very much doubt according to the experience I have had. But I am yet in hopes, that I shall approach nearer to this end, which may already have been attained by some youthful patient without my knowledge, by the following treatment, which I have lately begun to apply.

After the nares have been completely cleaned, and the side-cavities are washed out in the manner described above, water is injected successively 10 to 15 times, both morning and evening, with a solution of chlorate of potassium (1, 2 or 3 tablespoons full to a liter of water), which is made stronger according to the ability of the patient to bear it.

After a few cauterizations or insufflations of pulverized chlorate of potassium, which the patient may do in the morning into one nares, and in the evening into the other for 1 to 3 weeks, when the mucous membrane of the nasal cavity itself is generally found to be smooth, shining, pale, and normally reddened.

Chlorate of potassium has already been applied by *Siegle*, by means of an inhalation-apparatus, and *Eyselein* has used it in con-

centrated solution for cauterization with the brush in cases of ozæna, and has seen good results.

Permanganate of potassium, which colors lips and cloth, carbolic acid, which spreads a very disagreeable odor, are according to my experience much inferior to chlorate of potassium, as far as effect and acceptability are concerned.

As large quantities of the salt (Chlorate of potassium) are generally used, I advise the patients to buy it at the wholesale drug stores by the pound.—The sharp spoon (*der scharfe Loeffel*—*Schede*) can not be used in this affection; for there is nothing to be removed but the scales and the secretion, and for that the syringe suffices.

It might be commendable to apply the term ozæna only to the disease, which has just been treated of in the foregoing remarks, and which according to my understanding consists in a chronic purulent inflammation of the side-cavities of the nares, and which has endured from childhood.

Other more or less odorous affections of the nasal cavity can easily be diagnosed by examination, as also by the fact, that they have been acquired in later years, and consist in malignant tumefaction—syphilis, or scrofulous necrosis. (The latter very seldom, as I have seen it but once.)

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## V. SYPHILIS IN THE NASAL CAVITY.

In cases of general syphilisation (*general lues*) the nasal cavity is often affected with ulceration and bone-necrosis, a fact, which is well known. But hitherto the diagnosis, made by direct examination, has only been possible when striking changes were present at the entrance of the nasal cavities; such occurrences only being presumed otherwise when purulent secretion appeared. If pieces of bone came out, this furnished most unmistakable evidence, and if the nose fell in, that was regarded as the most sad reality of its presence.

The local treatment heretofore was confined to the snuffing up of water and the nasal douche. Both of which, however, are insufficient for the treatment of extended crust-formation. Cleaning of the cavities, together with a careful touching of the ulcers



in the nares, the mouth, the pharynx, the throat, or in general all over, wherever it were possible, was not done. However in the face of such evidence, as has been given in the foregoing pages, to wit: that the nasal cavity can be inspected and examined as completely as may be necessary; it can not well be longer neglected. I am convinced, that an early and careful use of the speculum and the rhinoscope will prevent such disfiguration of the face as is brought about by a falling in of the nose, or the cicatricial distortion of the nasal wings.

My observations relate to cases, where, after the disease in general had been overcome, a relapse ensued, which was chiefly confined to the nasal cavity.

In one case there was also an ulcer on the posterior surface of the uvula. In a second case a large ulcer was found on the back. With others nothing could be seen, which might be traced to a general affection (*Lues*). There was no trace of efflorescence, or swelling of the glands. 3, 5 or 10 years even 15 years had elapsed since an infection had taken place, and that had been cured by means of embrocations with "gray ointment (*grauer Salbe*), and the use of mercurial pills."

Whenever this fact could not be learned directly from the patients (by *anamnesse*—recollection), i. e. in cases of ladies, belonging to the higher classes, I concluded from the results, which were reached in a short time by the administration of Iodide of potassium, and a few cauterizations, that the ulcers in the nares had originated from syphilis.

After a few days even an improvement would be noticed, and soon the healing would be perfected; notwithstanding much effort with different remedies had been previously put forth in vain for the relief of the purulent secretion, crust formation, obstruction and pain.

I have not yet seen an ulcer in the nares, which could not be traced to syphilis, either through the confession (*anamnesse*) of the patient, or the success reached with the remedies exhibited.

If a patient presents himself, and complains of having had for some time obstruction in the nares, due to formation of crusts and scales, which can only be removed with the greatest difficulty, and of pain in the nares at times, which spreads from the nares to the head; then it is evident, that there is ulceration present in the nares, which has originated in syphilis.



Ulcers on the middle turbinated bone seem to be the most painful. According to my experience only malignant tumors of the nares cause more intense and extensive pain. But an examination with the speculum shows immediately that these are syphilitic ulcers instead of malignant tumors—as the cavity shows itself more or less filled with light-green scales; after the removal of which by the syringe, an ulcer is discovered on the inferior or middle turbinated bone or the septum.

The latter is often perforated, and very often a long or oval hole is seen in its cartilaginous part, and the bony part bordering on it. In one case only did I see the free border of the bony septum only remain, which stood like a thin blade between the choanæ. In two cases it was wanting for the greatest portion, and through the left nares I could see the right *Eustachian* tube during swallowing, etc.; and in this case I could partially renew my observations on the action of the muscles of the pharyngeal arch, as I have described them.

The parts, where these syphilitic ulcers produce the most disfiguration of the external appearance of the nares, are, the cartilaginous septum, and the anterior end of the middle turbinated bone, from where an ulceration can easily spread to the nasal bridge, and thus necrosis ensue.

Ulceration on the anterior end of the inferior turbinated bone can easily spread to the cartilaginous nose, and cause disfiguration of the nasal wings. An account of a few cases will follow here in a condensed description.

H. B., of Cologne, 28 years old, had been infected with syphilis 4 or 5 years ago. Has been married for two years; is father of a healthy child. For the last four months he suffers with obstruction in the left nares. A thin, watery, yellow mucus flows out; sometimes his breath has a disagreeable odor. Lately an unbearable pain became associated with it, which increased, especially on the left side, just after retiring at night. His face appears cachectic, anæmic, and somewhat emaciated. Nothing could be seen on his body, pointing to syphilis. Finally his family physician had again prescribed “quicksilver pills,” but without result. July 13, 1872.

The speculum shows, that the left cavity is obstructed through swelling of the middle turbinated bone, the mucous membrane of which is intensely reddened, and lies close to the septum, whereby the view into the pharyngeal cavity is obstructed.

With the rhinoscope the middle turbinated bone (as much of it as can be seen) is found to be yellow and ulcerating, and its immediate surroundings markedly hyperæmic.

The right nares is sound.—I prescribed Iodide of potassium, 2 : 200.

On the 19th of June the patient returned and reported, that after he had taken the medicine for 3 days, the pain passed away, and that now the nares was open again, and he was able to breathe through it.

Examination proves, that the ulcer belongs only to the middle turbinated bone. It has become smaller, and the swelling has diminished. The view into the pharyngeal nasal cavity is in part re-established.

The patient was now directed to use the same remedies for a few days more. About a year and a half after this, he came to tell me of his complete recovery.

Mr. X., of E., says, that he has for some months had obstruction in the right nares, in connection with profuse production of yellow—and at times more watery—mucus, with heavy dull headache.

On examination, an ulcer is found in the right nares on the anterior end of the inferior turbinated bone, with a wall-like border, which has the appearance of a piece of bacon, and is about 1 cm. in diameter. A second ulcer, opposite on the septum, is more flat, and a third one is found on the nasal floor under the one on the inferior turbinated bone. The cavity can only be inspected in its anterior part. The inferior and middle meatuses are closed through swelling of the turbinated bone, etc.

The patient says, he was treated for syphilis many years ago, by a physician in Silesia, but had since been pronounced completely cured by several physicians in Aachen.

On his breast and back an eruption is found, consisting of dark red pimples.—Prescription: Iodide of potassium 5 : 200, a tablespoon full 3—4 times a day. Aug. 23, 1872.

On the first of September the patient reported, that his right nares was completely open, and that the profuse secretion of mucus had nearly ceased.

All the ulcers are now smaller than they were—the swelling having disappeared. They are cauterized with nitrate of silver in substance. Iodide of potassium is continued internally.

September 15th, the ulcers are completely healed. The right

cavity is entirely open. One can see through into the pharyngeal vault.

Mrs. B., of D., of healthy, corpulent appearance. Has for the last year continually been afflicted with obstruction in the right nares with yellow secretion, formation of scales, and sometimes pain, which extends to the right side of the head. The voice has somewhat of a nasal tone. The sense of smell is gone. Snuff-powders (*Schnupfpulver*), cauterization with bluestone of the supposed polyp, snuffing of water (*Schnupfwasser*), etc., were used without avail.

Examination Nov. 7th, 1873. The inferior turbinated bone is wanting up to the posterior third of it, which is also very much reduced in size, but roughened and reddened. The middle turbinated bone is much swollen, is in a condition of ulceration on its concave surface and border, and touches the septum; posteriorly the septum is nearly in its entire extent changed into an ulcer.

With the rhinoscope the inferior turbinated bone can not be seen. The middle one is intensely reddened and swollen. The middle meatus is entirely closed, because the turbinated bone touches the septum. Of the superior turbinated bone only a small part is to be seen, which is yellow, and in a condition of ulceration. On the left side the middle turbinated bone is also swollen, ulcerated and yellow.—Prescription: Of a solution of Iodide of potassium 4: 180, one tablespoonful 3 times a day.

Nov. 16th. Two bottles of medicine have been used. The sense of smell has returned; breathing through the nares is easier; nasal speech has diminished; the ulcers are smaller, and the swelling is much reduced.

Cauterization with nitrate of silver, and an application of the galvano-cautery were used to reduce the hypertrophy of the mucous membrane. Within three weeks the ulcers were completely healed.

Mr. H., of C., has suffered for some months with obstruction in the nares of a high degree. He complains of profuse yellow, cream-like secretion; his head feels dull and heavy, the face is bloated, and the eyes are red as in a case of violent acute catarrh.

On examination the middle turbinated bones are found swollen, reddened, and touching the septum. The inferior are moderately hyperæmic, but less swollen, while the middle and superior meatuses are completely closed. Ulcers are nowhere to be found either anteriorly or by examination with the rhinoscope.

A solution of chlorate of potassium is prescribed with which the superior side-cavities are to be washed 2 to 3 times daily, as described in the chapter on ozæna.

After about ten days his condition appeared but little improved. No change was found on examination. Patient says, that he was afflicted with syphilis about 5 years ago. He now began to take Iodide of potassium, which after a few days produced a noticable change, and after 14 days, the yellow mucus, the obstruction, in short all the symptoms had disappeared. The face had a bright healthy appearance. The inflammation of the middle turbinated bone was removed, and the nasal cavity was in a normal condition all over. Whether in this case an ulceration, which had originated in syphilis, had been present in the cavities of the septum, and had become more violent through the irritation of a severe acute catarrh—I am not prepared to say.

Mr. T., a strong man, about 38 years of age, has been afflicted for the last year with a very irritating formation of scales in the right nares, often causing an obstruction with all its inconveniences. Lately this has been accompanied by violent pain, which at times came very suddenly, and spread from the nares to the face and forehead. Five years ago the patient was afflicted with syphilis.

On examination an ulcer was found on the exterior wall of the cartilaginous nares, spreading to the anterior end of the inferior turbinated bone; also one on the anterior end of the middle turbinated bone.

Prescribed Iodide of potassium. After a few days the pain passed away. Five cauterizations were made with nitrate of silver in substance, and in three weeks the nares were completely healed.—At home the patient cleaned his nose twice a day by means of injections.

Mr. X., of Westphalia, 40 years of age, of very healthy constitution. Ten years ago he was afflicted with syphilis; i. e. he was at that time treated with sudatory (*Schwitzkur*), wood-decoctions (*Holzthee*), and pills for a long time on account of an (*ulcus penis*) ulcer on the penis.

He complains of having had obstruction in the right nares for a long time (it is now September 8th, 1875), brought about by the formation of scales, accompanied often by headache to a considerable degree.

After the nares had been cleaned, it could be seen, that the anterior end of the middle turbinated bone was in a condition of ulceration; the bone being bare in part.

Iodide of potassium internally, cauterization with nitrate of silver, and the removal of a piece of bone after it had become loose; besides the daily use of a syringe brought about a healing in a few weeks.

After about six months the patient came again to me and said: "I have fared badly of late; for in the last seven weeks I have besides a copious discharge from the nares, suffered with intense headache, extending from the head to the face. It began here (pointing to the region of the right nasal wing), at the side of my nose, and spread to the cheek-bone, and over the forehead, behind the ear."

I thought, it must have been a trigeminus neuralgia. The family physician had also been of the opinion, that the pain could have no connection with the affection in his nose. He did not deem it prudent however to prescribe Iodide of potassium, when the patient told him, what wonderful effect it had on his former headache.

But I was struck with amazement, when through the speculum I saw the bare bone, gazing at me. There is not the least doubt, that the irritation of the nerve had been produced from the ulcerated condition of the inferior turbinated bone. If the patient had taken Iodide of potassium, as soon as the pain began, the supposed idiopathic neuralgia would have passed away within two days.

Of the 25 cases treated, there were but a few, who did not complain of pain, who only complained of a heaviness of the head, and a discharge of purulent secretion.

A bad odor, as in ozæna, is not connected with it,—at least, it is not nearly as prominent and constant.

In a few cases a rough piece of bone exfoliated, which had come from the anterior end of the middle turbinated bone. In some cases thin, smooth laminae from the bony septum were discharged.

## VI. TUMORS IN THE NASAL CAVITY.

Mucous polyps, commonly called nasal polyps, rank first among all the tumors found in the nasal cavity in point of frequency.

Not less than 135 of the persons, who came to me on account of nasal affections, were afflicted with polyps. The youngest among them were from 10 to 12, the oldest 70 years of age. 105 were males, 30 females. I operated on 125 of them. They were generally unable to give any more definite information than that they had suffered for a long time with mucus-obstruction in the nares, and frequent catarrh.

Often the same was said of brother, sister or the parents, and the patients always informed me, that they had ever had a great tendency to contract cold, and always felt very delicate in a sudden change of temperature, and that lung affections had often been present. In short, there were very few of them, who had come from healthy parents, and who had been very healthy themselves from their youth.

## SYMPTOMS.

Profuse secretion, mostly of yellowish mucus, and seldom purely watery, from the nares and pharyngeal vault; obstruction of the nares often growing worse acutely from swelling of the polyps, uneasy sleep, snoring, and loss of smell—are the most common phenomena. Also a sallow pale appearance, poor taste, a stale, sweetish odor of the breath, a frequent want of appetite, and choking every morning, as the mucus, which had accumulated in the pharyngeal vault, has to be removed.

With very emaciated patients profuse secretion is almost entirely wanting. Headache, dizziness, partial loss of memory, and difficulty in intellectual work are sometimes observed, especially where numerous excrescences have been in existence for years. The troubles in breathing have as a consequence, an inability for physical employment, which requires much exertion.

Bronchial catarrh, emphysema with pneumonia, was often pointed out, but attacks of asthma, as *Voltolini* more recently also *Haenisch* has described, as dependent on nasal polyps, have not been observed. Severe spasms of sneezing were observed once.

The patient, an old gentleman, was obliged every morning as



soon as he left his bed, to sneeze, till he was quite exhausted, in consequence of a strange tickling in the left nares. Besides other polyps there was to be seen in this case a round soft one of the thickness of a finger, that projected with a thin pedicle from the anterior end of the middle turbinated bone, as could be plainly seen after its removal.

Through swelling of the polyp, it evidently rubbed against the septum, which, as is well known, is richly supplied from the nasopalatine nerve of Scarpa (*II Ast d. trigem.*—branch of the trigem); these producing the sneezing, which ceased from the moment the polyp was removed.

Chronic partial deafness or frequent acute affections of the ears were very seldom complained of. If polyps had grown out of the choanes, or hypertrophy of the pharyngeal tonsil was present, then the patients complained more frequently of hard hearing, and of pressure on one or both ears. But these phenomena can just as well be brought about in a mechanical way—as the polyps and the pharyngeal tonsil hinder the movements of the Eustachian tubes, and thus prevent a sufficient opening of the tubes—as also in consequence of an intercurrent catarrh of the middle ear.

#### DIAGNOSIS.

If the bony and cartilaginous nose is swollen—the former condition seldom occurs with polyps of common size—or the polyps hang very far toward the front, the diagnosis can sometimes be made by simply raising the point of the nose; but generally the speculum will be needed. The speculum gives information of the fact in general, that light gray tumors are in the nasal cavity. With the rhinoscope it can be learned, whether they extend to the choanæ or not. Nothing definite can be known concerning the number and seat of the polyps only in the course of treatment, because they are one behind the other, and mostly too close together.

*The seat of the nasal polyps* is according to my experience in far the most cases, not the superior wall—the roof of the nasal cavity, but the middle turbinated bone. In cases where polyps have been present for years, it is much larger than the inferior bone, and its concave surface is considerably developed. The inferior turbinated bone is often found to be much flattened and diminished in size.



First of all, the anterior end of the middle turbinated bone is to be mentioned as the place, where polyps most often grow, and next the free border, the concave surface, and the posterior end, from where those mostly come, which hang down into the choanæ. The elevated position of this turbinated bone enables the swollen, raised mucous membrane easily to lower itself, and thus gradually form itself into independent tumors, and the circumstance, that in blowing the nose, the mucous membrane on these spots is very much hit by the current of air, whereby the swollen membrane is still more raised, may be taken into consideration, in explaining the fact just mentioned. Sometimes a chronic inflammation in the ethmoid cavity, the interior wall of which is formed by the middle turbinated bone, may be the cause of polyp-formation.

On the inferior turbinated bone soft polyps are seldom seen; only such changes, as have been described in the chapter on chronic catarrh, are generally to be found there.

With persons, who for 20 years and longer have suffered with polyps, those raspberry-like tumors, projecting from the concave surface, are found much enlarged and vibrous.

Only a few times did I see some small polyps project from the anterior part of the septum.—The roof of the nasal cavity furnishes but a small strip of mucous membrane, and I can not say, but that I have at most only in 8 or 10 cases seen tumors hanging down from there. The nasal floor I have never seen participating.

#### NUMBER OF POLYPS.

Very seldom is a solitary polyp to be seen. Once I operated on an old lady, who had only one polyp, which was somewhat drawn out lengthwise, of a pale color, and had grown on the anterior end of the inferior turbinated bone. Two patients had each one tumor at the entrance of the bony cavity, projecting from the septum. Twice I saw two or three tumors, which had grown on the posterior end of the middle turbinated bone, hanging down into the pharyngeal vault.

The patients could inspire comparatively easy, but could not expire through the involved nares, because the polyps acting like a valve, closed the choane. At first sight in the rhinoscope I thought they had their origin on the roof of the pharyngeal head; but after the operation I found this to have been a mistake, which may have occurred before in the same manner.

With eight patients one of the nasal cavities was free; but

generally both nares were filled with tumors, the number of which varied from 10 to 50. The small recent polyps are, as a rule, as large as a green pea, and round when they arise from the concave surface of the middle turbinated bone, and of oval form, when they have grown from its anterior end, or from its free border.

According to the width of the middle meatus, or the height of the cavity, the tumors are developed either thicker or longer. The thickness and width of the thumb will represent even the largest polyp which may be found in the nares.

Those projecting out of the choanes, have more room for expansion, and thus some are found here as large as a pigeon's egg. The largest I have found belonged mostly to those persons, who had for many years been afflicted with the affection, and who had wide cavities. The older polyps are harder, contain more fibrous tissue than the younger, which are light gray, often nearly transparent, and for the greatest part contain only liquid matter, and but little soft fibrous tissue. In the centre of some of the soft tumors a clear white, round spot is often to be seen, as if a little white grain had been put in there. On section I found a small round cyst, which was completely filled with cream-like, white, opaque mucus. Evidently the yellow whitish mass, which is often seen coming out of polyps, into which incisions have been made with the galvano-cautery, comes from such cysts. Perhaps these cysts are formed through the bursting of a bloodvessel in consequence of too severe noseblowing, when an infarction takes place, which thus becomes incysted and softened.

The formation of an abscess in a tumor which is wanting in fibrous tissue to such a degree, seems to me less probable.

As to the rapidity with which polyps grow in the nasal cavity, no definite time can be given, and the patients can not determine, when the tumors were added to the previous obstruction, brought about by the abnormal secretion of mucus.

#### TREATMENT.

Spontaneous coming off of polyps has at most been reported to me but twice.

Although cures by means of astringents (brushing, snuffing-powder) have now and then been reported, but I must nevertheless—even aside from the fact, that examination was wanting—doubt the correctness of this result; because I have often experienced, how carefully even the galvano-cautery must be used, to effect a complete cure.

The instrument, which has mostly been used heretofore, and which some seem to use still exclusively, is found to be represented by the cornforceps.

*Voltolini* has justly fought this treatment as too violent. I also believe, that I am able to offer the most substantial reasons in support of his view.

The operation with forceps is not accomplished under the guidance of the eye. One seeks, and feels, and tries, whether something hard or soft is taken hold of, as the forceps are pressed together.

But the nasal cavity is not a cavity with smooth walls, and of dull feelings. On the contrary it is supplied with projections recesses and has a mucous membrane, which is richly supplied with nerves, and therefore very sensitive.

No wonder then, that the unavoidable knocking and pressing against the walls in opening the forceps, and pulling on the wrong parts, which may have been seized, makes the operation painful in the highest degree.

I think, the following sentence can not well be impugned, viz., *that it is intolerable to operate blindly in a cavity, which lies all through open to the eye, and too with such a violent instrument as the forceps.*

But even if the choanes had been examined with the rhinoscope, and the forceps were ever so thin (as recommended by *Schroetter*), why should not the speculum be used in the nares, light thrown into the cavity and the forceps (if they have to be used) applied skillfully to the tumors. Knee-formed forceps would not hinder the view.

But the forceps have great disadvantages, even if they are applied in this natural, favorable manner; for the polyps very seldom sit on thin stems; the root is generally ligamentous, from 1 to 1½ cm. long, and 1 to 1½ cm. wide, according as the polyp has an oval or round shape.

Hence very often the root is not removed with the forceps, but only some of the mass is torn off—some pieces remain. And then, where at first there was but one polyp, two or three new ones form on the remaining pieces.

Or in case the polyps are of a tougher nature, the necessary turning and pulling occasioned thereby often makes the patient feel as if his brains were being pulled out; the surrounding mucous membrane is also more or less torn off, and a copious

hemorrhage, with a terrible shock of the nervous system is the frequent accompaniment.

Dislocations of the cartilaginous septum, fractures of the bony one, and tearing off of pieces from the turbinated bones, are occurrences, which take place quite frequently—as the distortion of many a nose, which had previously undergone such an operation, will show. No doubt, the pain is much increased thereby, and the operation becomes very shocking to the patient.

It needs only to be added, that a favorable result, a “healing” is only accidentally brought about. Or is it not an accident, when I seize a polyp. which I do not see, with forceps, so as to remove it, root and all, even if the cavity is wide, no bone-projections reaching into it, and the polyp sits anteriorly on the middle turbinated bone.

The uncertainty of the result, and the useless suffering of pain even in the hands of most highly distinguished surgeons, has caused patients, especially those, who had a great many polyps, to seek no further help.

Lately the simple loop has also been used by different operators. (Ear-surgeons use that of *Wilde*.) But without the speculum the result in this manner is also doubtful, as far as the successful removal of the smaller polyps is concerned, and those situated in the posterior part of the cavity.

Wherever the polyps are somewhat tough, or have a broader base, the wire brakes, for one has to pull pretty hard, and a very copious hemorrhage follows.

The treatment arrived at a new stage, when *Voltolini* (in the year 1868) came to the happy thought of applying the galvano-cautery and the galvano caustic cutting-loop in all parts of the nasal cavity, in connection with the nose speculum, and thus to clear the entire cavity completely of all its tumors.

To have discovered a remedy against a disease so far spread, which, if correctly applied, completely cures, is a result which patients cannot prize too much, and must be looked at as deserving great merit.

But in some respects I deviate from the method of *Voltolini*; in other respects, I think that I can recommend some important improvements.

As to the loop-eccraseur (*Schling-Schnuerer*) of *Voltolini*, I must freely confess, that I deem it less convenient and durable than the instrument which has been recommended by *v. Bruns* for galvano-caustic operations with the loop.

The latter is so easily supplied with a new loop, that it is not at all necessary to have several handles on hand in order to save time at the operation (*Voltolini*). If previously loops have been drawn into different tubes, and a wire should break, one needs only to lose about half a minute to unscrew the tube, and to supply the instrument with a new one. A glance at both the handles shows, what I have also found on a more close inspection of both, that that of *Voltolini* is much more inconvenient.

The ring in the slide is also better adapted than the lever, to draw the loop together. It is not necessary to make such minute calculations as to the size of the loop, as has to be made with the lever, by which a loop, that is only a little too large, can not be drawn together.

If a polyp projects out of the nares anteriorly, then of course the loop can be laid over it, and after it has been pushed up as far as possible, a complete removal can be accomplished.

But only in such a case do I operate without the speculum; for it is evident to me, that the loop can be introduced more favorably, and that one can succeed better, in removing the polyp completely when he sees, than without the guidance of his eyes.

Generally and with sufficient skill the common pharyngeal light suffices, but in some cases it is very desirable to have more intense light; and for want of it, one should not neglect to examine with sunlight in order not to be misled.

I now operate in the following manner: The patient sits, and leans his head on a headrest (*v. Burns*), as in laryngoscopic examination. The lamp is placed to the right of the patient. The loop is arranged square-shaped; the tubes running at the side of (not above) each other.

After the speculum has been put in, the loop is introduced in sagittal position; then it is held squarely again, and brought under the free end of the nearest polyp; then, moving it slowly upward and downward, it is gradually pushed up higher until a solid resistance is felt. This resistance is either caused by the spot, where the polyp grows, viz.: the middle turbinated bone, or a projection—a spinous process of the septum. But it is all the same; if one now pulls on the ring of the *ecraseur* for the purpose of drawing together the loop, he feels that it has taken hold of a soft mass.

Then the current is caused to work, which is done by a pressure upon a lever-like apparatus on the inferior surface of the

handle. At the same time the loop is gradually drawn together. After a few moments of hissing it yields, and in the next moment it is seen coming out of the nares with a tumor. If the current is sufficiently strong, the pain is very moderate, and ceases entirely, as soon as the instrument has been removed from the nasal cavity.

If one has been successful in taking off the polyp clear to the root, then the surface of the burned spot is seen to be smaller, regarding its length and width, than the burned off end of the tumor, and is always surrounded by a border of smooth, shining undisturbed surface. But if the polyp has only been cut through in its mass, then the white burned spot spreads over the entire surrounding surface. But for the present I pay no attention to these remaining portions, as I attempt to re-establish first of all the connection with the pharyngeal vault—the through-passage of air, if possible at the first operation.

After the field of operation has been cleaned by means of the syringe, or by a bunch of wadding, wound around the head of a long probe, I bring the loop to the next polyp, and proceed as described above; and thus I continue until the choanes are reached.

According to the width of the nasal cavity, and the presence of obstructing projections from the septum, the number of polyps, and of course the degree of skill displayed, this desired end is reached in the first sitting; or several have to take place, before one can see into the *cav. phar. nas.* (pharyngeal vault.)

When the great difficulty, the obstruction has been removed, then a closer inspection must be made, to see, whether there are small tumors on the concave surface of the middle turbinated bone, or on the roof of the nasal cavity, or if some remnants of removed polyps are present. It is especially necessary to look sharply, and to examine closely with the probe, in order to find out, whether the mucous membrane on the anterior end of the middle turbinated bone is not rugged, or in a state of hypertrophy.

What can not be taken hold of with the loop, is removed with the galvano-cautery, especially the hypertrophy of the mucous membrane.

Often in some cases, even after the view through into the *cav. phar. nas.* had been established, at the next sitting, polyps of large size were found in the middle meatus, contrary to ones expectations. The cause of it is this: after manipulations have been



carried on in the nares for some time, it is impossible in consequence of the swelling of the mucous membrane, plainly to distinguish between the contents of the cavity.

If the polyps hang closely together in the posterior part of the cavity, or if larger ones are found there hanging down into the pharyngeal vault, then one will often try in vain, to remove them with the loop. At best only little pieces can be taken out. In the one case the loop can not be pushed up between the polyps, in the other it can not be brought down, and under the free end, reaching out of the choane into the vault of the pharynx. A very thick wire (No. 0 or 1) might perhaps be strong enough to overcome more resistance—would not bend so easily; but it would get hot very slowly, and thus cause considerable pain, and would surely be followed by a strong reaction in the surrounding regions. I therefore use the galvano-cautery immediately after a few unsuccessful attempts with the loop.

If the patient gives sounds, the mass of tumors is seen moving upward (raised by the velum); and if now the galvano-cautery is applied as high up as possible, where the moving is still plainly to be seen, then the polyp is generally removed by the root. (*Voltolini* advises the galvano-cautery altogether, unless the loop is very successful from the beginning.) In the following sitting there will be more room, as the polyps will have shrunk and died. The galvano-cautery is now from 5 to 10 times applied in the same manner; or in case of more favorable circumstances, the loop can now be laid around the tumor, which has grown out of the choane, and it can be removed by the root.

The polyp often falls down into the throat, as the instrument is drawn out, because it (the tumor) is too large to go into the nares. With a choking it is thrown up again. The full air-current is now re-established at once.

The operation becomes very tiresome, if absolutely no air can be forced through the nares, to blow out the mucus, which has accumulated in the nasal cavity, and has to be wiped out, in order to clean the parts for further operation. The mucus is tough and sticky, and is produced with great rapidity. A repeated introduction of the wadding-mop is necessary, whereby much time and patience have to be sacrificed, especially with children, or sensitive, nervous weak-minded persons.

If a nasal cavity is much obstructed through incurvations of

the septum, or bone-projections, then only thin, smooth polyps are found there, whilst thick tumors may hang out of the corresponding choane.

And if one has cleaned the easiest side first, which for good reasons is to be preferred, he will (if for instance the right cavity has been made free) often find a portion of a tumor coming from the left, hanging before the right choane.

In one case I introduced a large sagittal loop (the tubes running above one another), through the right nares into the pharyngeal vault. I succeeded at the first in drawing the loop toward the left as far as I could, by moving the handle as far as possible toward the right; then drawing the loop together, I caused the current to work. In the next moment a broad, very tough polyp, about one inch thick, fell into the throat of the patient, an old gentleman, about 70 years of age, and very nervous; he was just as much astonished as he was highly rejoiced over the painless operation, and the considerably greater current of air, which suddenly began to pass through both his nares.—Not even half a teaspoonful of blood flowed in consequence of the operation.

In another case, where an old gentlemen had also been troubled for a long time with polyps, this treatment was not successful. Here the cavity was much obstructed by a curvature of the septum, and only small tumors were hanging down from the anterior part of the middle turbinated bone. The right nares was very wide, and filled with about 20 larger and smaller polyps. Notwithstanding their previous removal, the patient could not breathe freely through the right nares; especially was the expiration much hindered.

Only a very thin current of air passed through the left nares. With the rhinoscope the cause was easily learned. A large crooked tumor lay across the inferior part of the choanes. By the septum it was divided into a larger left and a smaller right portion. Although a part of the tumor could be seen from through the right nares, and could be pushed back with the probe so far as to definitely establish its origin from the left side; yet I failed entirely to seize it in the manner just described.

I then had recourse to the pharyngeal polyp—*ecraseur* (of *Voltolini* modified by the author). I supplied the same with a loop about  $2\frac{1}{2}$  cm. wide (wire No. 3), bent it somewhat over toward the front, brought it behind the velum, and pushed it up quickly, until it hit against the roof of the pharyngeal head, so

that the handle nearly came from the horizontal to the perpendicular position. Then I drew the instrument toward me—the strong tubes overcoming the strength of the soft palate—until the bony palate was reached. Then I drew the loop together. With gnashing it settled down. A strong pulling would have been necessary to draw it out again, had not the galvanic current supplied it with cutting force. It soon yielded, and a tumor of the size of a small plum was hanging in it. A second smaller tumor was immediately thereafter removed in the same manner. The hemorrhage—the patient being plethoric, and about 50 years old—was about half a wineglass full. The pain somewhat increased by the fact, that the tumor rested upon the soft palate. From through the nares no more could be seen of a tumor, but the rhinoscope showed, that the removed pieces had been taken off from an old fibrous tumor, which originated on the posterior end of the left inferior turbinated bone. A part of it remained to be removed at a later sitting. The patient described the sudden ease in breathing as really refreshing.

Obstructions, caused by bone-projections from the septum, are best overcome, by making the loop as small as possible, and putting it into the nares in sagittal position below or above the projection, according to the relation of the polyp to the same, where it may be brought into horizontal position.

Or the little galvano-cautery is applied, which one can put everywhere. Fortunately there are, as has been observed already, only a few small tumors in much obstructed cavities. A very disagreeable but infrequent combination occurs, when small polyps are found on the roof of very narrow nares.

In narrow cavities the anterior end of the middle turbinated bone always lies quite near the septum; it is separated from it only by a small crevice. Without the probe one can not see through here; but the anterior end of the turbinated bone, which in such cases is always softened through swelling, and loosening of the mucous membrane, can easily be pushed aside.

In order to determine, whether the gray shining mass, which is seen, is a mass of mucus or polyps, the probe, wrapped in wadding, is rubbed over the concerned spot, and then it is again examined. Eventually a small loop can be pushed up between the septum and the turbinated bones to the roof, and everything, which comes into its way, and can be embraced, must be cut off; although the eye can not follow it everywhere. But it is always

necessary to see, whether there are any low vegetations present, which must be destroyed by the galvano-cautery.

In several cases I have used an instrument with success, which is like a pair of forceps, knee-formed, with strong springs, the distal ends of which are changed into thin plates.

It is to be conducted into the nares closed, and pushed upward between the turbinated bone and the septum; when the spring power being left to itself, the superior meatus is thus opened for inspection, by the pushing aside of the anterior end of the middle turbinated bone. The broad plates make the pressure bearable, and as they are very thin, they do not obstruct the light from falling in. Besides this, their length and knee-formed shape also make it possible for the patient to hold them without hindering the operator in his work.

#### INCIDENTS DURING OPERATION.

Hemorrhage to a disturbing degree very seldom occurs if proper care is taken, and a thicker wire is used (No. 4 or 3), when patients are plethoric, while the current is checked repeatedly, so that the tumor is thus burned off somewhat slowly. If the patients are old and anæmic, or the tumors are of a tougher kind, then I use a thinner wire (No. 5), and let the current work uninterruptedly, in order to perform the operation as quickly and as painlessly as possible.

In a casual occurrence of hemorrhage, injections are to be made, as has been described in the chapter on "Chronic Catarrh." By turns the stream of water may be turned to the exterior of the nose. Only in one solitary case was I obliged to tampon.

A healthy old gentleman, whose face and nose were quite red, had a small red, oval polyp on the anterior end of the left middle turbinated bone, which I tried to remove. At the moment when I was drawing the loop together—the most irritating part of the operation—the patient struck my right hand, which was holding the instrument, with such force, that the instrument was carried off some distance. Immediately the blood streamed out of the nares. The drops followed each other in such close succession, that they almost formed a stream.

Injection of cold water, and also with enough persulphate of iron in it, to make it quite yellow, availed nothing. I had to fill the cavity with wadding to control the hemorrhage.

But in the afternoon the patient came again, because bleeding

had recurred ; much blood being thrown out from the throat. As I pulled out the plugs of wadding one after the other, I could see, that the bleeding, which was now more moderate, came from near the free border of the convex surface of the middle turbinated bone.

With the knee-formed forceps I pushed a thick piece of German tinder up between the middle turbinated bone and the septum, and immediately the hemorrhage stopped entirely. Prudently the patient, who resided on the dutch borders, remained over night. During the evening he applied ice water cloths to his nose. On the fifth day the tampon fell out, but the nose did not bleed again, as the patient reported, when he came again to have the galvano-cautery applied on account of chronic catarrh.

The anterior end of the middle turbinated bone was quite normal and smooth ; the mucous membrane was closely attached. Evidently here was an aneurismatic expansion of the capillaries, of which *Luschka* says, that it often is present on the anterior end of the middle turbinated bone. This case, on the one hand, was very instructive, because I saw a very copious hemorrhage ensue, after the loop had been torn off, and on the other hand, because I have learned, that it is better for the future, not to lose too much time with the injection of water, or the pushing in of wadding into the nasal cavity, without any direction, to tampon in the old manner, but to bring German tinder to the bleeding spot, with the aid of the speculum. One can also without the speculum get up between the middle turbinated bone and the septum, if he takes the septum as his guide, and does not get off its surface.

#### FAINTING SPELLS.

In the chapter, which treats of the examination of the nasal cavity, it has been observed, that sometimes, when the middle turbinated bone is touched, or the septum, sudden spells of fainting ensue. Thus I have also seen at the first sitting sometimes—especially after a polyp had been removed, or only had been seized on the anterior part of the middle turbinated bone—a sudden paleness of the face appear. The patient suddenly becoming indisposed, perspiration breaking out all over, &c. The operation had to be discontinued, as in every subsequent trial the tendency to fainting returned. These phenomena occurred not only in weak, delicate women, girls and boys, but also in strong persons—not at all irritable—in workingmen, soldiers, peasants

&c. It seems to be brought about by an irritation of the ethmoidal nerve, and seems to consist in a reflex contraction of the brain vessels, by which brain-anæmia is produced.—There are also branches of the trigeminus running into the *dura mater*.

#### RESULTS OF THE OPERATION.

The patients are generally not at all hindered from going about their daily business. They are even in winter allowed to go home on the same day without injury. The nose secretes profusely a watery mucus, which often makes the nares sore, sometimes only reddens it. The patients always feel more or less affected in their head, as with a fresh catarrh. But if the operation was protracted unusually long, or if the loop had often been introduced in vain, in consequence of hinderances, and the nasal cavity had thereby been irritated more severely, or 10 to 15 polyps had been removed, and if thus a large number of wounds had been made—then the patients often felt hot, with frequent pulse on the second day, no appetite, felt indisposed, and suffered for several days with headache, etc.

A few times a moderate swelling of the face, on one or both sides, was also reported. But never has a case of erysipelas of the face, or any serious illness, as a result of the operation, come to my knowledge.

Nevertheless, I always observe this rule, not to make the first sitting too long, and to remove only a few polyps, and then see, whether the patient has a tendency to fever or violent reaction or not.

Also this fact is not to be overlooked, namely, that on the one hand the chief seat of the polyps is very near the nasal roof, which is formed by the cripriformed plate of the ethmoid bone; and on the other hand, that the sphenopalatine foramen, through which the posterior sphenopalatine, nasal artery of the septum, enters (*Art. sphenopalat. s. nasal post.*), is found to be very close to the end of the middle turbinated bone; that the ethmoidal veins as they empty into the superior ophthalmic vein, communicate more or less with the sinuses of the *dura mater*.

#### AFTER-TREATMENT.

As to the after-treatment I tell patients to keep quiet in case of serious indisposition. to abstain from coffee, tea, spirituous liquors, and to observe a soup-diet, to drink a glass of mineral



water (*Bitterwasser*), to apply a wet cloth (*kalte Aufschlaege*) to the hot forehead for some hours, and to make cold injections into the nares as often as is agreeable.

But patients must always use nasal injections from two to three times a day to keep the nares clean and free of infection until the next operation. They use for this at least a liter of water, to which 1 or 2 tablespoons full of chlorate of potassium has been added. The solution should not be too strong, should not irritate or smart. If this is the case, the patient must weaken it. The chlorate of potassium must be previously dissolved in hot water.

#### NUMBER OF SITTINGS.

If there are but a few polyps present, and the loop can easily be applied, nothing stands in the way of a complete removal of all tumors in one sitting. But as a rule from 10—20 polyps are found, which can, aside from everything else, not be removed in one sitting, because the smaller ones are soon removed from sight on account of the swelling of the lining of the cavity. (*Hoehlenbekleidung*, i. e. the mucous membrane.)

The second sitting may take place after 8 to 14 days or three weeks, in accordance with the desire or leisure of the patients.—On some patients, who came from a distance, and who could not return on the same day, on that account, I operated 2 to 3 days successively. The general condition did not show itself much or not at all disturbed thereby; nevertheless the pulse was often somewhat more frequent.

At the second sitting, very often at the first, I get so far, that I can see into the pharyngeal vault. In exceptional cases this does not take place until after the third sitting. Then the passage of air (*Luftdurchgang*) is for the greatest part brought about again, and the patient is relieved of his worst difficulty. At this moment every operator, who has employed any other method, and who has worked without the speculum and the rhinoscope, would lay aside his instrument with complacency. But a minute examination would yet discover many remnants and small polyps to be removed, and would show that there is yet much to be done before a final cure could be spoken of.

To bring about this result, several sittings are generally necessary, and in all cases of a higher degree a control of the disease must be maintained for a longer time. If patients desire to be definitely cured, and do not wait to see whether the obstruction of the nose will recur

again or not, then they must come repeatedly for some months. And with those patients, who have a strong tendency to contract cold, several young polyps are often found again, or roughened swelling on the anterior end of the middle turbinated bone, whilst otherwise the mucous membrane is closely attached, and shows a normal condition. Those patients who soon come with a healthy bright appearance, have no knowledge of their presence, as the free breathing, and the feeling of ease (*Wohlbehagen*—comfort) is not at all disturbed thereby. The tendency for bronchial catarrh is much diminished, and breathing is more free and easy, but the secretion of mucus is very much increased.

However as long as yellowish mucus is noticed, which sometimes drops out when the patient bends his head forward, there must be polyps still left somewhere, and a swollen inflammatory condition of the mucous membrane must exist, and one must not yield until he has discovered and destroyed them.

Those cases require the most care and demand the greatest number of sittings, where former operations had been made with the forceps; evidently because the mucous membrane has become still more affected in consequence of the irritation. And from the pieces, which remained as the polyps were torn out, a large number of tumors had grown. Sometimes 2 to 3 or more have sprung up where one had been.

In skilful hands the galvano-caustic operation is the most painless, bloodless and the easiest. There is no instrument so long and thin as the galvano-caustic loop, which has at the same time such unyielding power. The burner can not be replaced. *Nevertheless a careful and skilful examination is the only surety for a lasting cure of this disease.*

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## VII. PAPILLOMATA OF THE NASAL CAVITY.

A Mr. W., from Amsterdam, came to me with an obstruction of the left nares, which he said had troubled him for years.

The entrance of the concerned nares was completely filled with a red mass, which had the appearance of colliflower.

In the morning and afternoon a large number of pointed, kernel-like small tumors were removed with the galvano-caustic

loop, which were partly connected together by a bundle of fine fascia.

After they had been removed it could be seen that only the anterior end of the inferior turbinated bone, the part of the septum just opposite it, and the anterior part of the nasal floor were affected. The little papilla and crests, which were too small to be removed by the loop, were destroyed with the galvano-cautery. The nasal cavity thereby being made completely smooth in two sittings.

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### VIII. MALIGNANT TUMORS IN THE NARES.

In one case it was evident that common polyps had become changed to malignant growths. The patient, now about 63 years old, said that he had been affected with polyps for about 30 years. About 15 years ago he had called up on a very celebrated operator, who had refused to remove them for him.

On both sides I took out with the loop thick tumors of tough construction, which had distorted the cartilaginous nose; but after 6 weeks I found that they had grown again; the whole cavity was now very irritable; the inferior turbinated bones were especially very much swollen. There was everywhere a great tendency to bleeding. Altogether I had abundant cause for a serious prognosis.

After three months, an abscess appeared on the right nasal bone. The probe met with a rough bone, which evidently belonged to the roof of the nasal cavity, as I concluded from the direction it took. After two months more death ensued under symptoms of pyemic infection and brain-phenomena.

In two cases the following symptoms were present in common: Headache, painful straining in the nasal cavity and nearest surrounding, copious discharge of mostly watery secretion from the nares, flowing of tears, hawking of blood from the throat, and permanent obstruction of the respective nares, which in consequence of the great irritability of that organ often became absolute.

By means of the speculum only the right cavity of the one patient was found to be diseased, and the left only of the other. In the one case a blue-gray smooth tumor was found, in the other a

roughened pale-red mass with some objects in it. They appeared to come from the middle turbinated bone. The inferior turbinated bone was also much swollen, and lay more or less close to the septum, whereby the inspection of the whole cavity was prevented.

In the rhinoscope the meatuses were seen to be obstructed, by the swollen turbinated bones touching one another and the septum. The swelling of the nose and face after a trial to operate, increasing the suffering, caused thereby, instead of the otherwise never failing diminution, while the relatively strong hemorrhage increased the suspicion of malignant affection in the nasal cavity. This suspicion was soon substantiated in as much as the general condition began to grow worse, also by the emaciation feverish pulse, etc. A progressive new tumefaction (*Neubildung*—new formation) on the upper jaw and the orbit also took place. The ages of the patients were 50 and 63 years, respectively.

A Mrs. T., 49 years old, said that one year ago she had first observed flowing of tears from the right eye, and on consultation had been told, that the tears came from "*a lachrymal fistula*", and that after the flowing of tears had ceased, a red spot began to appear on the exterior of the nose, and the right nares became more and more obstructed.

Of pain she did not complain, excepting a feeling of soreness on the hard palate.

The touching of the swollen cartilaginous nose or the tumor in the same, would easily and often cause bleeding.

The appearance of the patient is sallow, emaciated. A sister of her's died "with a cancer in the lower bowels". In the right nares a light red tumor is seen, which is granular on its surface.

Besides this only the anterior end of the swollen inferior turbinated bone can be seen, which touches the septum and the nasal floor.

In the rhinoscope no special abnormality is to be seen. The inferior turbinated bone is moderately swollen and reddened, but is in part covered by the soft palate.

The red spot on the nose corresponds to the nasal bone. It fluctuates—a fact, which shows, that the bone is softened and broken through. Chlorate of potassium was prescribed to be strewed upon the parts or used for insufflation. Later information was to the effect, that perforation had taken place, that the other side of the cavity had also been attacked by the disease.

If everything can not be destroyed at once clear to the healthy parts, then the cells only become incited to a more acute inflammation, on which account the knife and saw have to be employed instead of the galvano-cautery. The latter (knife and saw) will surely bring about lasting results. if persons with the described symptoms are at an early stage examined with the speculum and the rhinoscope.

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## IX. EPISTAXIS.

At different times persons were examined, who came with the complaint, that from the slightest cause they would have nose bleeding—remarkably easy and often. But only in two cases could a cause—an explanation—be found.

A lady, 63 years of age (widow), of a healthy plethoric family, yet herself anæmic, and of a pale-yellow appearance, says, that for the last 12 years—i. e. after her always profuse—menstrual epochs had ceased, she has had very frequent hemorrhage from the nares. About every 3 to 4 weeks it would bleed from the left nares. Sometimes the phenomenon would be wanting for a few months. But in October (1874) the hemorrhage ensued almost daily. The least excitement, i. e. a glass of wine or a lively conversation would bring it about. She was also often awakened during the night by blood running down her throat and causing cough.

A tumor was supposed to be in her nose. But when by the advice of my colleague, *Dr. Lohmar*, she was examined by me, it was found, that the nasal cavity was quite free; but in the left nares on the septum. I saw, opposite the anterior part of the inferior turbinated bone, a small black spot of desiccated blood.

In touching it with the probe, the blood immediately drizzled down from under it, and flowed steadily over the nasal floor into the pharyngeal vault. By pulsations, and keeping time with the pulse, it came out of a fine opening about as large as the thickness of a needle.

I applied the galvano-cautery to the spot. At first the hemorrhage became stronger, because in taking off the burner, the scab made by it was also removed. But after the hemorrhage had been checked somewhat by the injection of cold water, I applied a broad burner; again laying it on cold, and then letting it be-

come red hot. Then I interrupted the current for a moment, and made it red hot again for several times. After this when the burner now was carefully removed, the hemorrhage did not recur. The scale measured about  $\frac{3}{4}$  cm. in diameter. It had to be large in order to erode not only the bleeding vessel itself, but also its surrounding communication for some distance. The next day the lady observed, that she felt a sensation of increased warmth in the upper teeth, since bleeding from the nares had ceased.

The burner was again applied to the gray-black scab, to connect it more closely with its underlayer. The desiccation of the blood on the inferior surface of it helped to bring this about.

*Second case:* A., weaver from Gr., 26 years old, came Jan. 12, 1876 with the complaint, that he was suffering with epistaxis. For three years previous he had suffered for a time daily hemorrhage, and had become "quite feeble in consequence, so as to be almost unable to walk."

Nearly three years ago *Dr. Kuepper* of Elberfeld had taken something out of his nose, thereupon he had rest for about two years; but since the summer of 1875, the bleeding had again ensued several times a week. He had bled in the morning on the cars.

As I put the speculum into the right nares, hemorrhage began immediately; therefore I thought, the source must be at the entrance of the cavity. No blood came from above. The nasal floor only was covered with blood, but I could not discover whence it came. I did not see any spot, where I might be able to apply the burner. By a compression of the nose the blood stopped. All I could now see, was, that the septum opposite the anterior end of the inferior turbinated bone appeared more reddened, and a few blood vessels seemed to be somewhat largely developed. I touched these parts lightly with nitrate of silver, and advised the patient to come again in a few days.

January 16. No day had passed without nose-bleeding. I barely pushed the speculum into the cartilaginous nose and opened it carefully, when I saw—quite anteriorly at the entrance of the bony nose, close to the nasal floor, on the septum—a little spot of desiccated blood, not larger than the period over the "i", which I barely touched, when the blood flowed out copiously.

With the burner—the battery had been previously arranged—I stopped it in the manner just described above.

Jan. 23, the scab has fallen off, but no hemorrhage has ensued since the operation.



## X. FOREIGN BODIES IN THE NASAL CAVITY.

The following case of a girl, from Ems, two years old, I consider worth mentioning in this connection. Her mother relates, that she has been afflicted with purulent secretion from the nares with bad odor, and obstruction of the right nares, since she was 6 months old; that during sleep she would snore, and often be disturbed on account of dryness of the throat and thirst.

Notwithstanding the consultation of different authorities, her condition did not improve. Scrofulous ulcers were mostly mentioned as the cause. Finally one physician thought he had discovered a polyp, the operation of which was only incidentally delayed. The anterior end of the right inferior turbinated bone had by mistake been taken as such, because it was swollen, and could be seen when the point of the nose was raised.

The child quite willingly permitted a small speculum to be put into her nose. I then pushed the turbinated bone somewhat aside with the probe, and plainly saw a black object at the anterior entrance, and felt a hard body there. With the knee-formed forceps I pulled out a piece of black sole-leather, about the size of a full grown thumb-nail. It was quite black and gave off a penetrating foetid odor.

Anteriorly the septum was somewhat corroded near the nasal floor. Nothing else was to be found in the nasal cavity, which could now be very well inspected, as the swelling on the inferior turbinated bone had immediately passed off. Evidently the piece of leather had been put into the nares of the child—as the mother supposed during a long visit in the country—and having been put in rolled together, it had expanded through moisture, and then had unrolled itself, and thus its falling out was prevented, and it remained there.

## DISEASES OF THE PHARYNGEAL VAULT.

Acute catarrh appears mostly in connection with a general pharyngeal catarrh, or is associated with an acute catarrh of the nares.

Chronic catarrh of the pharyngeal vault is, according to my observation, very seldom an idiopathic disease. The text-books, in giving a description of it, fail to pay sufficient attention to the condition of the nares. If these were always properly examined, the complaint of patients about obstruction of mucus (*Verschleimung*), of dryness, and sensation as of a foreign body in the throat, would mostly be explained by the presence of ozæna in a greater or lesser degree; or a chronic nasal catarrh, nasal polyps, or hypertrophy of the pharyngeal tonsil, any of which may often be the only cause of the affection. A swelling of the follicles will very seldom be found in the vault of the pharynx. Only through the removal of the idiopathic disease can a cure be perfected.

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### I. ULCERS.

As to the appearance of ulcers in this cavity (phar. vault), I have to make the same observation as in ozæna, i. e. that yellow layers of mucus and scales have often through mistake been taken for ulcerations.

My experience corroborates that of *Mr. Wenät*, who represents the opinion of *Troeltsch*, that extensive non-syphilitic ulceration was often found in the pharyngeal vault to be erroneous.

Wherever I found corrosion (*Substanzverlust*, loss of substance), and purulent secretion in the cavity after a careful cleaning, I diagnosed syphilis. In several cases (6) where the patients, who complained of insufficient pliability in swallowing (*Schlingbeschwerden*) and pain, and had for a long time struggled against it in vain with gargles, etc., the cause of the affection was easily discovered by means of the rhinoscope.

Generally an ulcer might be seen on the posterior wall, oppo-

site the Eustachian tubes, or some round, yellow excavations in the centre of the posterior wall. Syphilis had preceded.—The following cases might be worth mentioning.

1. Mr. X., a medical man, has always been healthy. He knows nothing of ever having been affected with syphilis. But some years ago, after an operation, he had a swelling of the lymphatics under the arm.

A few weeks ago (in the winter 1874), difficulty in swallowing (*Schlingbeschwerden*) ensued, accompanied by the feeling of a foreign body in his throat. Soon he discovered on the anterior surface of the swollen uvula, an ulcer, the size of which increased. The examination undertaken by me with the rhinoscope, showed an ulcer of considerable depth and about  $1\frac{1}{2}$  cm. long, on the posterior surface of the uvula, about the centre of it.

Several cauterizations with nitrate of silver in substance, were unsuccessful. The ulcers unmistakingly grew in their width; but as soon as Iodide of potassium was taken, the troubles diminished, the local treatment became successful. The ulcers cleaned themselves up, and healed completely within 14 days.

2. S., a tailor-apprentice, 17 years of age, says, he has never had swelling of lymphatics or efflorescence on the skin. He also affirms that there has been no occasion for infection. Yet he complains that he has, for some months, had moderate pain in his throat, and now (Feb. 8th, 1875), when he drinks, the water, etc., flows in part out of his nares again. He has no pain now. The rhinoscope shows a large round ulcer of  $1\frac{1}{2}$  cm. in diameter on the posterior pharyngeal wall, toward the left side, and opposite the uvula. The surroundings of it (i. e. the ulcer) appear much swollen and reddened. The uvula is separated from its root on the left, and hangs on the right side like a tumor, about the thickness of a little finger.

After six strong cauterizations with nitrate of silver in substance, and Iodide of potassium taken internally, the ulcers cicatrised, occupying about three weeks and a half. In consequence of the disappearance of the swelling on these parts, the phenomenon of the inadequate shutting off of the throat from the pharyngeal vault disappeared. The defects of the soft palate remained however. The lateral aspect of the posterior surface of the uvula has grown to the posterior pharyngeal vault.

In the beginning of January, 1876, S. came again in accordance with my wish. The pathological condition, of course, re-

mained the same, but nasal speech had improved in consequence of the strengthening of the uvula. And only in drinking very hastily, would a flow of water, etc., out of the nares take place.

S. again declares that there had been no occasion for an infection, as he had up to this day never touched a female. He believes, that the beginning of the suffering in his throat must be traced back to a day, when he felt hot, pulled off his coat, and seated himself on the threshold. The members of his family have always been healthy, parents and all, but several sisters of the mother have died of consumption.

3. B., a railroad officer, about 40 years of age, very good health, has served 18 years as a soldier—a corporal. Has been through three wars. About 6—8 weeks since he began to have trouble in swallowing to a moderate degree.

The anterior surface of the left posterior palatal arch is for the greatest part in an ulcerated condition, presenting the appearance of bacon. Another large crater-like ulcer is found on the posterior wall behind the uvula, extending upward into the pharyngeal vault. On the right the posterior palatal arch has grown to the posterior pharyngeal wall. Some years ago he was treated in a military hospital for an ulcer, the origin of which was doubtful.

Cauterizations, and Iodide of potassium internally soon perfected a healing of the ulcer on the posterior wall. But the one on the uvula would not clean itself up, even after cauterization with potassium and the galvano-cautery had been applied. Embrocations of ciner salve (*Ungt ciner*—ash-ointment), had yet to be applied to bring about cicatrization.

4. H. Bergmann, married, says, he has never been infected. His wife and children are also healthy.

The rhinoscope shows the cause of his trouble in swallowing (in part it can also be seen without it in the *pars nasal.*), to be a large round ulcer at the head of the pharyngeal vault, opposite the superior part of the velum. The surroundings of the excavation are largely swollen and reddened.

Within three weeks four strong cauterizations were made with nitrate of silver in substance; with it and Iodide of potassium a cure was perfected in the described time.

In all four cases every cicatrice was wanting as well as efflorescence, and generally every other sign that an infection ever had taken place, was wanting. The state of health in general was

not disturbed. With three of the four it could hardly have been better. Only the apprentice S. appeared somewhat pale and weakly.

I could not regard them as scrofulous ulcers. I had to conclude that either an infection had taken place through the use of a vessel, a pipe, etc., or that hereditary syphilis had long remained latent, but had finally been brought forth in consequence of the irritation of a violent *angina*—and it making itself felt in the way of ulcers just described.

*Wendt* also speaks of having found on post mortem examination tuberculous ulcers, erosions of large dimensions, which were brought about in consequence of acute inflammation of the mucous membrane.

On living persons I have as yet seen nothing of the kind. This in part may be owing to the fact that in tuberculous ulcerations the lung- and throat-phenomena predominate—that they generally make no complaint of anything else

A pharyngoscopic examination is not often made, inasmuch as those, who are troubled with cough, have a great tendency to choking, which makes an examination very difficult, if not impossible.

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## II. HYPERTROPHY OF THE PHARYNGEAL TONSIL.

*Luschka* was the first who applied the name "*Tonsila pharyngea*" to the glandular tissue, which resembles the substance of the palatal tonsils, and which covers the greatest part of the pharyngeal roof, and the posterior wall of the pharyngeal arch downward to a line, which connects the inferior ends of the Eustachian tubes. *Wendt*, in his diseases of the pharyngeal vault and the throat, has given a comprehensive anatomical description of these parts, where also a complete list of works, treating of this branch of medical science, is to be found. I shall here confine myself to a description of the clinical phenomena, according to my observations, and give directions for diagnosis and treatment depending thereon.

I have the material of 92 cases to work upon, which I have observed the last four years. This number is in contradiction to *Voltolini's* opinion, who, in comparing his observations with those

of *Meyer*, thinks, that this disease was not of such frequent occurrence in Germany as in Denmark.

#### SYMPTOMS.

*Wil. Meyer* has already described the symptoms of the cases of a high degree very comprehensively and exactly. On this account I shall be more brief.

It is principally the respiration through the nares which suffers. The mouth being constantly opened. The face has a shy, indolent expression, because the line of the nasal wing is lengthened (*die Nasenlippenfalte ist verlaengert*). The nostrils are often remarkably small, having evidently been checked in their growth. During the night the patients snore strongly and sleep restlessly.

The voice is much changed—soundless. “dead” (*Meyer*). Often difficult hearing is present, sometimes headache, concentrated on the vertex. A pale, sallow color of the face is never absent. A phenomenon, which indeed I have only seen once on a girl 8 years old, and which I do not find recorded by *Meyer*, is a drawing down of the inner canthus of the eyes so strongly, that the little face had a strange chinese appearance.

Evidently, the inferior maxillary, in hanging down constantly, had strained and stretched the skin of the face. For after the extraordinary hypertrophy of the pharyngeal tonsil had been removed, this distortion also passed away.

*In cases of a moderate degree of hypertrophy, especially in adults, the symptoms are less clearly defined.*

Complaint is made of obstruction through mucus (*Verschleimung*) collecting in the throat, of choking in the morning, of a desire (*Beduerfniss*) often to breathe (expire) by starts through the nares, and of being constantly obliged to bring down mucus from above. The patients find that in singing they can not long hold to high notes, that they soon get hoarse, and that their nares are very often obstructed. Close observation shows that the lips are seldom closed, but are constantly kept opened a little (if not much). They say, it is inconvenient for them, to breathe with closed lips. During the night they sleep with the mouth open. The voice is sometimes changed a little, but the weak sound is only noticed by a trained and acute ear. Again, if the patients keep their mouths closed, something unusual is noticed in their features. A lax condition of the lips is observed, while the angles are drawn down.



The color of the face is bad also—even in cases of a moderate degree; it is grayish or sallow hue, though the patients—children as well as adults—may live under the most favorable circumstances. As soon as the swelling has been removed, the face becomes healthier and more youthful. It also acquires a greater fullness and becomes rounder. Very often a chronic catarrh of the pharynx and hypertrophy of the palatal tonsils are found in connection with hypertrophy of the pharyngeal tonsil. Sometimes also the nares participate through chronic catarrh, or less often through polyps.

## DIAGNOSIS.

In most cases—*Meyer* thinks, a diagnosis can not often be made—the diagnosis however can be made out through the nares—on the one side or the other, by means of the speculum, which will show that the pharyngeal arch is not in a normal condition. If the inferior turbinated bone is in the way through swelling, it can easily be pushed aside far enough with a probe for one to look through into the pharyngeal vault. Behind the choana, a pale-red, roughened tumor may be seen. It moves upward especially in swallowing, less in giving a sound, and as the act is completed, it sinks down again. In one case (the patient being a boy, 10 years old), I could, by simply lifting the point of his nose, see through the wide nares with the reflex mirror, and the light of the sun, to the tumor in the pharyngeal vault, without using a speculum.

In swallowing the posterior pharyngeal wall below the Eustachian tubes makes a strong movement upward. In giving a sound, the tumor is pushed upward by the uvula and the Eustachian tubes. There generally remains but a small space between it (the tumor) and the nasal floor. But if the inferior turbinated bone is in the way, it can easily be pushed aside with the probe, so that one can easily look into the (*cavum*) cavity.

With the knee-formed probe, as already described by *Meyer*, a soft sponge-like mass is felt, which can easily be divided, pushed apart, and it will readily be seen, that it has clefts. It is not sensitive to the touch.

In a normal condition the posterior wall of the pharyngeal vault lies farther backward, and only a weak movement of its smooth shining membrane is perceived. In the superior part no movement at all is noticed. The probe meets a hard resistance, and causes a sharp painful sensation.

But not everything which moves is to be taken as tumefaction. Sometimes the Eustachian tubes are enormously developed, which may give occasion to deception. Thus one must be careful, and examine first with the rhinoscope, in order to be sure what the condition is before he applies the burner. With the square loop no harm can be done under any circumstances. *Meyer* thinks, the examination with the rhinoscope is generally difficult and unsatisfactory. *Voltolini* is of a directly opposite opinion. For myself I have explained in a former essay, how the presence of tumefaction makes rhinoscopic examination easier, because it checks the mobility of the soft palate.

If one follows, as described above, first the posterior pharyngeal wall in the mirror, he will observe that below the Eustachian tubes it passes gradually into a pale-red, cushion-like, rugged swelling, without well defined border, and having several furrows drawn upward and downward, covering the superior part of the posterior wall and the roof of the pharyngeal head.

The superior border (*Bogen*—arch) of the choana can not be seen, nor the superior third or half of the septum; frequently also the posterior end of the middle turbinated bones are excluded.

Often the tumor appears quite smooth. One is obliged to examine very closely to find some shallow furrows. In other cases again, it has a very rugged appearance, showing deep—broad incisions—according as the pieces and crests, of which it mostly consists, are thicker and higher, and stand closer together or farther apart.

On the descending part of the Eustachian tubes the height of the crests and edges always running parallel, can be easily measured, as the latter are generally higher than the former. In the fossa of *Rosenmueller* long and high crests and bundles (*Wuelste*) are generally found on the posterior wall in cases of hypertrophy to a considerable degree. In the bottom of the fossa smooth, thin crests are often seen, standing somewhat sideways.

On the posterior part of the Eustachian tubes (the anterior wall of the fossa of *Rosenmueller*) some flat, bean-like or roundish crest-like elevations can always be noticed. Sometimes they are found a little farther downward on the lateral wall of the pharyngeal head up to the free border of the uvula. Here the mucous membrane is often evenly thickened, which, in connection with a swelling of the follicles—for as such the flat, smooth elevations must be looked at—gives a solid block-like appearance to these parts.

The Eustachian tubes are generally covered in part. At first sight they appear much larger than in a normal condition, because at their borders they are connected with the swollen parts.

The centre of the posterior wall, beginning a little distance below the Eustachian tubes, is sometimes very smooth without any swelling of the follicles.

In some cases only a small part of the choana—the entrance of the middle meatus, can be seen, but when the uvula hangs down very loosely, the inferior turbinated bone and the inferior meatus can be seen partly.

If the tumefaction is strongly developed, a moderate elevation of the soft palate suffices to suspend the prospect, as both parts come more or less into contact.

With children this occurrence takes place much easier, as the passage itself is very narrow, and the distance between the uvula and pharyngeal wall very small. Here it also often happens that even in a case of moderate hypertrophy nothing can be seen of the choanæ. The changes which have just been described, can therefore not always be determined or distinguished, either with children or adults, until the swelling has been in part removed, so that more light can enter, and the posterior wall has at least in part received its normal level again.

On the other hand it is often possible to distinguish the presence of tumefaction without the mirror, because the pharyngeal arch of children is very low. As a sound is given or a movement of choking ensues, or in a condition of quiet, a pale, gray, rugged projection may be seen winding around the posterior wall, somewhat above the free border of the soft palate, which is nothing else than the inferior part of the hypertrophied pharyngeal tonsil. *Voltolini* already speaks of this kind of general diagnosis.

As the hinderances to rhinoscopic examination have already been described, and hints have been given as to how they can be overcome, it may here suffice to say, that with the palatal hook one can always distinguish, whether extended tumefaction exists in the pharyngeal vault or not.—*Voltolini* sometimes operates with the aid of the palatal hook.

In cases of moderate hypertrophy, which on an average is found more often, the examination is easier and does not require so much time.

At the roof and the boundary line of this from the posterior wall the red cushion-like tumor is thickest. It is more largely

developed here than on the posterior wall. On the sides near the Eustachian tubes the edges are more abrupt and very low. The fossa of *Rosenmueller* and the Eustachian tubes are generally entirely free from elevation, and show a smooth normal condition. With the moveable mirror, which can be brought into a perpendicular position, every part of the choanes can be inspected. The swelling has quite a regular, somewhat lengthened quadrangular appearance, and diminishes (especially at the centre) the height and depth of the pharyngeal arch.

Once I saw it hang down from the roof free on all sides, as a red lump-like pivot, covering two thirds of the septum.

The normal pharyngeal arch has smooth walls and has no other projections than the Eustachian tubes. If there is an elevation between and above them on the posterior pharyngeal wall, which can be seen plainly, and which is large enough to be taken hold of by the loop and removed, then it is a pathological phenomenon. The described symptoms will more or less be found, and will not pass away until the tumor is removed and the arch has been leveled.

Of course, there are people, to whom obstruction by means of mucus, difficult breathing through the nose, a weak toneless (*matte, klanglose*) voice (with often total loss of voice in singing), and even hard hearing, etc., seem to be matters of small consequence, and they therefore will have to keep their hypertrophied pharyngeal tonsil to themselves.

If an acute nasal catarrh is present at the same time in consequence of which the tonsil is in a state of inflammatory swelling—a fact which is noticed by the intense red color—then this condition must first pass away before the degree of permanent hypertrophy can be discovered. In general the proportions of the swelling are hard to be determined, because the mirror is more or less perpendicularly below the object, and has to render the image of it very much diminished in length. Sometimes one is astonished at seeing such a thick piece in the loop, as it appears very small in the mirror.

The failure of the nasal douche consists in this that the injected water flows out of the same naris again, and that nothing, or only a little of it, gets into the pharyngeal vault and the other naris, which fact is always noticed. During the time in which water is thrown into the nares, the levator uvulæ muscle is in a strongly contracted condition, because the uvula is drawn up with

so much force, and comes into contact with the tumor, whereby the pharyngeal vault is divided into two parts, one on each side, as *Meyer* expresses it.

If a crest or a part of the swelling is found on the roof, only a centimeter high, the nasal douche is nevertheless greatly hindered thereby, often entirely prevented, until the swelling has been removed, when it can be applied with perfect success. This fact is easily explained by the short distance between the roof and the bony palate, where the soft palate is inserted, which on an average is only 2 cm.

There is still another diagnostic expedient, which may be mentioned—the digittal examination of *Meyer*. It has undoubted merits, especially for one who is not skilled in the use of the rhinoscope. I have applied the same but once. The case was that of a girl 14 years of age, I had removed a large number of pieces of different sizes, which had originated in the hypertrophy of the pharyngeal tonsil. A projection on the posterior wall near the roof would not yield. Several times I could plainly feel that the loop sprang off from a hard object, but I was unable to find out what it was. Through examination with the finger I learned that the elevation was of bone, and therefore not an object for further operation.

#### TREATMENT.

*Voltolini* was the first who operated on the tumor under consideration, and who did this with the galvano-cautery under the direction of the rhinoscope.

I use the instruments which he recommends—excepting the catheter. I use the galvano-cautery also very seldom now, and the rhinoscope only for examination.

In using nothing but the loop I now remove all the larger and smaller outgrowths from the cavity, so that the walls receive their smooth, normal condition again.

As has been observed above in by far the most cases the tumor, can be seen from the anterior nares, at least on one side, even without the help of the probe. On this account I also use the speculum in operating. I introduce the loop (about  $1\frac{1}{2}$  cm. long, and 1 cm. wide, with the tubes running at the side of each other) in perpendicular position through the nares until it reaches the choanum. I then turn it, in order to get it into a horizontal position, press it up to the tumor until resistance is felt, then

draw the loop together and open the current. In a few seconds this is done, and a piece of tumor comes away in the loop. In this manner, i. e. when I can see how to bring the loop under and onto the tumor, I take out the largest pieces.

The largest parts of the tumor have a crest-like appearance, and measure in length about  $2-2\frac{1}{2}$  cm., in height  $1-2$  cm., and in thickness  $5-10$  millimeter and more. They originate on the posterior wall, or the space lying between there and the roof. The oval pieces or rough roundish pivots, hanging down from the roof, are shorter. The crests, standing laterally (in the fossa of *Rosenmueller*), are thin, being flattened by the pressure, which has been exerted upon them by the Eustachian tubes in the act of speaking, swallowing, etc.

The surface has clefts, is ragged, or appears smooth, but on a more minute inspection it is always found to be also granular. Sometimes the kernels are close to each other and well developed; again they may be quite isolated, and are then very flat. Once I found among them a vesicle resembling a swollen sago-kernel.

The color is light red, seldom a dark blue-red. The smallest flat pieces are pale and rose-colored. The texture (*Gewebe*) is fragile, easily torn, loosely put together, sticky and soft; but sometimes, especially with older persons, it is tougher.

The only painful moment is, when the loop is drawn together, and that only to a slight degree. The disagreeable tickling, caused by the loop and tubes in passing through the nares, becomes reduced to a minimum, if it is done with care, skill and gentleness under the guidance of a speculum. The painful and disagreeable sensation generally ceases with the removal of the instrument. Blood flows generally but very little into the throat, as can be seen by inspecting behind the posterior arches of the palate; but a few inspirations through the nares with the mouth closed, and with the consequent hawking, suffices to bring it on again. If the head is bent forwards, a few drops will run out of the nares. A few injections with the syringe suffice to stop the hemorrhage and to clear the parts for further operation. In a few instances there occurred also attacks of fainting and nausea—as in operations upon nasal polyps together with examinations made with the probe—which were evidently caused by the irritation of the nasal cavity. For in using the pharyngeal-polyp-loop (*Rachen-Polypen-Schnuerer*) I have never seen this occurrence.

*Voltolini* says in relation to the employment of the loop: If



the vegetations are very long or pivot-like, then the medium sized galvano-caustic loop can be used. It is to be conducted through the nares into the pharyngeal vault; then pressed against the superior pharyngeal wall as much as can be done (without its being bent too much), and then drawn together, etc. One feels very plainly when he pushes the loop out of the nares into the *cavum* (phar. vault).

According to this, *Voltolini* does not use the speculum at the same time. One may succeed in removing parts of the tumor without it, but he can operate much surer, when he sees than when he is obliged to feel. If one must rely upon the feeling alone, he will quite often push the instrument too deeply down into the pharynx; thus introducing it in vain much more often than when he can see. Bone-projections and deformities of the turbinated bones are insuperable obstructions to the passage of the loop.

Either it can not be pushed into the pharyngeal vault at all, or if this is accomplished—under loud cries of pain from the patient—it can not be applied to the pharyngeal roof; it can not be pushed up, because the bone-projections resist it. Formerly I brought the galvano-cautery behind the velum, in cases, where the loop could not be used successfully through the nares, and with the aid of the rhinoscope succeeded in destroying the different elevations; or I pushed the galvano-cautery through the nares—according to circumstances either through the inferior or middle meatus—looked for the point of the galvano-cautery by means of the rhinoscope, and followed it up as the right hand moved the tubes. Thus I would bring it upon the tumor concerned; then lay aside the mirror; attach the ends of the tubes to the handle, let on the current, etc. Thus, it will be seen, I operate about the same as *Voltolini* does with his galvano-caustic catheter.

But for the last six months I have been able to dispense with this slow and difficult method, for I learned to use the pharyngeal polyp-loop, the instrument recommended by *Voltolini* for operating on the hypertrophied pharyngeal tonsil, but which, as it seems, is not used by him. This I had modified so as to have a lock-apparatus (a little knob), attached to the side, which can be pressed down by the ring-finger after the loop is drawn together. Thus I need no assistance to close the current, and besides can operate quicker. Again the conducting tube can be unscrewed, which can not be done with the instrument of *Voltolini*. The instrument

can be cleaned and the blood blown out, a thing which must be done after each operation. If one of the wires or tubes becomes injured it can readily be replaced, as the handle is at all times servicable. In place of the ivory plate and screw there are two little tacks, made of bone, with holes in them to fasten the ends of the wire with. This is not so easy to manipulate as the screws; but as the screws soon wear out—as the thread is rubbed off by use, thereby soon becoming useless, it is preferable. Besides the loop is apt to get loose, become drawn out of the tubes, or let go of what it had already taken hold of—an incident, which is very disagreeable to the operator as well as to the patient.

Below, on the handle between the two ends of the conducting wires, there was a little knob; this has been removed, and thereby the surface has been made smooth, giving a better support to the thumb for counter pressure, as the index- and middle-finger draw the loop together.

In consideration of the height of the soft palate, which on an average amounts to from 2.5 to 2.8 cm., I give to the tubes a bend of about 2 to  $2\frac{1}{2}$  cms. The pharyngeal roof is about 1.8 cm. distance from the insertion of the uvula, the nasal floor, and the hard palate; therefore only a moderate lowering of the handle is needed, in order to reach the roof. If an operation is to be performed here, I bend the tubes more towards a right angle. The loop is about  $1\frac{1}{4}$  to  $1\frac{1}{2}$  cm. wide, and bent toward the handle, so as to form an obtuse angle with the tube upon toward the front. The wire must be strong (No. 3—2), if the irritability is great. Nos. 3 to 4 can be used if from the beginning the walls are quiet, and tend only moderately to be thrown into spasms, at the moment the instrument is pushed up.

Whilst the tongue is held down with the spatula, the instrument—the tubes of which are always parallel to one another—is held and conducted with the hand in a position about half way between pronation and supination until the loop has passed the border of the soft palate; then the hand holding the handle is turned, so that the broad surface of the handle and the back part of the hand are both turned upward; at the same time the hand is lowered, thereby causing the loop to ascend. The behavior of the pharyngeal wall against this invasion (*Eingriff*) is as follows:

As soon as the instrument (loop) gets behind the uvula, more or less choking ensues in consequence of its coming into contact with the parts. Contraction of the *levator veli*, the pharyngo-

palat., the *stylo*-pharyngeal, and the superior constrictor muscles takes place as well as a constriction of the canal itself. And thus in a strong spasmodic action, if the loop is not of strong wire, it will not remain uninjured, but will be bent and rendered useless by the time it gets up there. Often it can not be carried up along the posterior wall as desired, because it strikes either against muscular bunches (*Muskelwuelste*), or the inferior end of the enlarged pharyngeal tonsil.

If the choking patient is requested to breathe, which will cause the general contraction to cease, the walls then will return more or less to their natural position; the favorable moment is to be now quickly improved. But these hindrances are best avoided when the loop is bent anteriorly, and pushed up on the smooth posterior surface of the soft palate.

Once in a case of a boy, 12 years old, after several unsuccessful attempts, I finally discovered the hindrances by means of the rhinoscope, and could avoid them as the pharynx was exceptionally wide.

It will be readily felt when the loop gets above the region of this muscle-obstruction (lying between the openings of the Eustachian tubes) by the ease with which it can be moved. If it is to be pressed to the roof, the handle is now lowered somewhat, or if to the posterior wall, it is raised a little.

When the roof is reached, which is known by the resistance offered, the loop takes a position parallel to the wall, and any elevation on it is taken hold of. As the pharyngeal tonsil has a lobulated character, it is better to use a small loop, as has already been observed, so that it may get into the furrows of the tumor, between the rugæ and crests and thus the easier take hold. A large loop may also strike anteriorly against the ends of the turbinated bones and cause severe pain.

As long as the tumor is still entire, the loop catches less easy, especially in a case of moderate hypertrophy, than if some opening has already been made. To remove it all at once can not be done, because it is not a pedunculated tumor, but a swelling, which spreads over a broad area, which is to be removed.

If only the centre of the roof is to be reached, and the pieces to be removed, are hanging down before the septum, then the patient must be directed to hold his head straight, and the tubes must remain in precisely the same direction as the uvula. The more the tubes deviate from this position, the more the lateral parts of the roof are reached.

If the loop is to be applied on the posterior wall, it must be bent a little less toward the front. For it will catch on the parts between the Eustachian tubes or somewhat below, if it is left in the same direction while the tubes are bent at an obtuse angle.

The rugæ and crests in the fossa of *Rosenmueller* (generally thicker, longer, tougher and harder than the other parts of the tumor, as *Meyer* has already described) can only be removed with difficulty, or not at all from through the nares. The reason of it is this: as soon as the loop has come out of the choana. the muscles of the pharynx contract in consequence of the irritation; the uvula ascends, as I have shown before, and a correspondingly strong elevation of the Eustachian tubes takes place at the same time. On this account the fossæ are misplaced and the loop is prevented from reaching there, as also from operating anywhere at the sides. This difficulty is still more increased, if the inferior turbinated bone is largely developed, while the middle meatus is narrow, in which case the loop can not be brought over the Eustachian tube into the fossa of *Rosenmueller*.

But with the instrument described above the operation succeeds completely. A thick wire, No. 2 is put in, and the loop is made somewhat wider. It runs in the same direction as the tube, bent at an obtuse angle, and is quickly pushed up behind the most lateral part of the uvula, and always remains on the side and posterior wall of the pharyngeal head. Soon it strikes against the roof, and if now the instrument is drawn back a little, the loop will get into the fossa of *Rosenmueller*. Being pressed backward, it catches the elevation, which may then be removed.—It is hardly necessary to say, that the loop can be used in this way without any fear of danger. Superiorly, the walls, the roof, and posterior wall are stiff. On the side there is a large layer of muscles between the large branches of bloodvessels and nerves and the mucous membrane. Although below the Eustachian tubes the posterior wall is wrinkled, yet it is better to have it made smooth by an inspiration before the loop is drawn together.

The Eustachian tubes, standing as wall-like, smooth semi-lunar-shaped projections, can not be embraced by the loop, arranged squarely. The less resistance is offered by the pharyngeal walls, the more sensitive they are, the more surely and desirably does the loop work. I therefore always repeat the request to the patient to breathe, in order to quiet the muscles of the pharynx.

Sometimes the loop comes out without anything in it, because the piece has been pushed out behind; but as it (the loop) remained firm and there is bleeding, it may be seen with the mirror, and to remove all doubt, as to whether the piece has been taken off, and to ascertain the bleeding points, the mirror had better be employed.

The pain is generally very moderate and transient. Behind the Eustachian tubes it seems to arise somewhat easier and to be more intense. It is often described as a head- or neckache, less often as ear- or toothache. In very exceptional cases it is said to spread like lightning toward the eyes. In using a thick wire (No. 3 or 2), it is necessary to supply the batteries with fresh acids, in order to furnish a strong current, or else the piece will be burned off too slowly, when more lasting pain ensues.

The described mode of operation is by most patients said to be more painless and more agreeable than that made through the nares. The way to the tumor is much broader, and can be traversed much quicker. The mucous membrane is not sensitive to such a degree. I therefore begin, especially with children (the youngest of which was a boy 6 years old), with the pharyngeal polyp-loop. They are thereby made more willing, and the fear is also taken from them.

If the conditions are favorable in the nares, if the patients bare the tickling, so that they can keep the head unmoved after light has been thrown in, which even children of from 8 to 10 years of age can do, after an earnest persuasive talk—unless they belong to that effeminate class, who have been spoiled by false training—then I operate on everything that can be seen and reached from the nares, as has already been observed. If the nasal cavity is not sufficiently open at the beginning of the operation; after there has been manipulation carried on in the *cavum* several times from through the mouth, then the one or the other naris often becomes enough widened or opened. Evidently a drawing of the blood towards the pharyngeal arch takes place in consequence of the irritation, the submucous tissue is less filled, and the inferior turbinated bone becomes smaller. The posterior sphenopalato nasal artery supplies both in common.

The use of the pharyngeal polyp-loop in the manner described, has this advantage, that the rhinoscope needs only to be used when the seat and size of the elevations may be determined. There is no need of having the palatal hook, the spatula, the

galvano-cautery and the mirror in the mouth at the same time. Thus the method which *Voltolini* describes as the most difficult of all, can be dispensed with.

The patient is spared many trials, and the physician much patience and exertion. The use of the galvano-cautery and the galvano-caustic catheter through the nares is also more inconvenient and timetaking for both parties (patient and physician) than this method. Whilst the burner has to be applied repeatedly to each elevation, and has therefore to remain in the nares for a longer time, as its position has often to be changed or corrected; but with the loop it is cut off completely and in a moment.

It is self-evident of course that one must have a minute conception of the cavity, in order to make the movements skillfully and easily. Besides rhinoscopy, the digital exploration is of service. The method of *Meyer* consists in using the tonsillotome by the guidance of the finger; then to apply cauterization by means of nitrate of silver. Sometimes he also uses the galvano-cautery in connection with the rhinoscope. (*Stoerk* has recommended articulating choanæ-forceps.)

But these instruments are much larger. They produce more pain and more hemorrhage than the galvano-caustic instruments, which are thinner. That the reaction is also stronger *Meyer* himself admits. Sometimes I have also removed parts of the tumor, for instance soft, small crests with the simple loop. But the galvano-caustic loop is always much less painful.

#### RESULTS OF THE OPERATION.—AFTER-TREATMENT.—NUMBER OF SITTINGS.

It is better not to prolong the sittings too much, but to discontinue them after a few pieces have been removed, in order to prevent violent inflammation. The patients can remain without further observation. The after-treatment (consisting of injections of a solution of chlorate of potassium, and repeated 2—3 times) the patients can manage for themselves.

They feel themselves more or less affected, either on the same day only or on the following days. For a few days they look pale, but do not complain of headache. Sometimes they complain of moderate dysphagia; in their expectoration yellowish mucus is noticed.

In several of my<sup>3</sup> cases a strong vertigo of the head and fever ensued the next day after the instruments had been introduced



through the nares (about 10 times), the patients being obliged to go to bed. Although I have never seen any more serious phenomena, nevertheless reports of this kind induced me thereafter regularly to make the sittings short. Purulent inflammation of the middle-ear often followed the operations of *Meyer*, and in cases operated by *Wendt* with the tonsillotome (*Ringmesser*—ring knife) inflammation ensued in both ears.

In the case of one patient, a strong young man, 26 years old, violent ear- and headache ensued quite suddenly about two hours after the operation, as he had been sitting in the *coupe* of the railroad waggon for a while, through the open window of which a strong draught had blown in the right ear, having entered it (the *coupe*) in a state of incalcescence. In a few days perforation and purulent discharge followed. By a diligent use of the apparatus of *Pollitzer* and a careful cleansing, a complete restoration of the hearing was affected. But it is yet very doubtful, whether the operation was the cause of these phenomena.

In another case pain and hard hearing did not ensue till the third day, when perforation and purulent discharge followed. But during the same winter the patient had to go through the same process twice more, without any operation having preceded.

Here the extraordinary sensitiveness of the skin and the strong tendency for contracting cold must be looked upon as the main cause, so much the more as after the frequent operations, which were performed thereafter, not the least signs of inflammation of the middle-ear were noticed.

As to the intervals between the operations, I generally operate from two to four times at most within 14 days. Formerly I had to operate from ten to twelve times in all, but since I have used the pharyngeal polyp-loop, 4 to 6 sittings are sufficient.

## CONSEQUENCES OF OBSTRUCTION IN THE NARES AND THE PHARYNG- EAL VAULT.

The impediment to breathing is the most important, and has the greatest influence on the entire organism. As a rule, inspiration and expiration are disturbed in about the same degree, but the latter more especially when polyps are hanging out of the choanæ, and by expiration are drawn into the nares by the current of air so as to close it (valve-like).

Whilst naturally breathing is done through the nares in times of rest, and the mouth is kept closed, such patients are obliged at all times to breathe through the mouth. By this coercion the unconscious, involuntary act of respiration is made to be a very disagreeable and uncomfortable occurrence. It also doubtless causes irregularities in the number and depth of the respirations. During sleep the mucous membrane of the throat soon gets dry, as also the secretion coming down from the pharyngeal vault. More or less uneasiness is felt, and sleep becomes restless—frequent awakening occurring.

Snoring is always conspicuous. The narrowness of the passage between the back of the tongue and the soft palate is made narrower yet through the falling back of the tongue. The increased volume of air, caused by the deeper inspiration in sleep, cannot enter quick enough through this small space; consequently the air is much diluted in the mouth and throat; a whizzing trembling movement of the velum and epiglottis ensues.

In such positions, in which they are compelled exclusively, or for the most part, to breathe through the nares, the patients experience much inconvenience.

In eating they gasp and pant; they have to masticate and swallow quickly, in order to get the mouth free again. Smoking, where the nares are obstructed, is either impossible or is accomplished only with so much exertion, that it ceases to be an enjoyment, which to miss is no small trial to many a one; but after a few short puffs the patients have to lay aside the cigar or pipe in order to draw breath, whilst a healthy person can at the same time with the same breath, fill the mouth with smoke and the lungs with pure air through the nares.

In singing, speaking, running, lifting heavy weights, or, in short, during any physical exertion whatever, when there is a greater abundance of air needed, the necessity arises at the same time of inhaling as much air as possible in the shortest time.

But if one of the air passages be closed or insufficiently open, then a new hinderance is caused thereby in satisfying this want. To overcome this it is necessary to breathe even more quickly, the exertion must therefore be still greater, and it will also require more time until the commotion in the lungs ceases, and deep breath can be drawn again. If lung or head disease, or disturbance of respiration from other causes are present, then these difficulties are very much aggravated by an obstructed nasal cavity. Or if there is a tendency to nervous asthma, the irregularities of exchanging oxygen or nitrogen in the blood, caused by the irregularity of breathing, may even bring about attacks of spasms.

It remains to be mentioned that the greatest number of patients affected with the disease, under consideration as has been shown in the different chapters of this work, have a weakly constitution, and a tendency more or less to contract cold and catarrh of the air-passages. The course of bronchial or lung catarrh of such patients will certainly be more lasting and obstinate than where breathing can be accomplished equally well through both mouth and nares.

The fact that patients, suffering with chronic catarrh, nasal polyps or hypertrophied pharyngeal tonsil, all have a pale, sallow appearance, look emaciated and old in proportion to the degree of the affection, and that after a complete cure they soon become vigorous and healthy—is explained by the irregularities in breathing as to number and depth of respirations drawn. Although the increased secretion is also to be taken into account, but the purulent character of it being much less prominent than the mucus, it can take but very little part in bringing about this phenomenon.

Even after the operation upon a moderately enlarged pharyngeal tonsil, I have often observed a great change in the patients' appearance—which was not only observed by me, but also by their friends who knew nothing of the operation.

This is easily explained, if the size of the pharyngeal vault is taken into consideration; its width is 3.5 cm.; its height 1.8 cm.; its depth 2 cm. A tumor, for instance, at the roof of the pharynx or the posterior wall, of only the thickness or the height of a single centimeter would reduce the most important diameters of the cavity one-half.

I have seen hypertrophied tonsils of the pharynx in children only three or four years old, as well as chronic catarrh, and nasal polyps in some of 8 or 10 years of age. The hinderance to the action of the lungs resulting therefrom, will, besides the bad influence in preventing the exchange of (*Blutgaase*—bloodgases) oxygen and nitrogen in the blood, surely also hinder the growth of the lungs, and thus diminish their ability to perform their function in after-life.

*E. Wagner*, in his diseases of the soft palate, mentions several observers who think that hypertrophy of the palatal tonsils in those of tender age, would bring about a deformity of the thorax. In the lower parts it would be bent inward; the sternum bent somewhat forward; the spinal column be crooked, similar to the breast of a chicken. Or the sternum would be bent inward; on the contrary, the lateral parts of the thorax projecting outward; the spinal column not at all or but little bent. The muscles of the thorax often strikingly weak. The cause of this is said to be the diminished amount of air admitted into the lungs, which would cause a compression of the thorax by the exterior atmosphere.

If this is the case, then these results may also be brought about, when the air is hindered from passing through by obstructions in the nares, or the pharyngeal vault.

*Wagner* further remarks! "The entire organism is injured in a high degree; the patients mostly appear pale and emaciated, less often bloated, somewhat bluish. Soon after the large palatal tonsils are cured, the swelling is reduced, these disturbances disappear."

With children as well as with adults of about 20 years of age, who only suffered with hypertrophied palatal tonsils, these phenomena are frequently observed to be more or less prominent. Not only is the *isthmus faucium*, the entrance from the cavity of the mouth into the pharynx narrowed by hypertrophy of the palatal tonsils, but also the posterior palatal arches are pressed backward and upward, by which the lateral parts as well as also the entrance into the nasal pharyngeal cavity is much diminished in its space. Thus breathing through both mouth and nares is hindered.

The consequences on the physiognomy of the patients can plainly be recognized. The inferior maxillary is always hanging down; thereby the upper lip is lengthened in the angles of the mouth; the folds of the nasal wings are flattened (*Meyer*), and in one case, of a high degree, I observed, that the inner angles of

the eyes were drawn down. The forehead often lies in wrinkles, and has the expression of a constant feeling of uneasiness.

All this in connection with the pale, sallow color of the face disfigures, and often entirely removes inherited beauty. But if an individual is affected with this disease, who was originally endowed with less regular features, and if the same is also hard of hearing, then not only a stranger, but even parents, brothers and sisters may be induced to look at such a patient as weak-minded (as an idiot in the highest degree—*Meyer*).

The peculiarly changed, perverted speech makes the idiotic, laughable appearance even more prominent. In cases of a high degree the nares are strikingly small, also the whole cartilaginous nose, in consequence of this incomplete development.

Since I have observed the shape of the roof of the mouth, I have found in corroboration of a remark in *E. Wagner's* "diseases on the soft palate," that it is often remarkably pointed and high-arched, that the front teeth sometimes project outward even to some degree in moderate hypertrophy of the pharyngeal tonsil.

In breathing through the mouth a full current of air incessantly strikes against the palatal roof, whilst the air enters but sparingly through the nares, and can not therefore exert its influence on the walls of the nasal cavity (in progress of growth), to expand or widen them.

*Robert* after *Meyer* found the cause of these deformities to be a diminished calibre of the posterior opening of the nares, which with the surrounding parts became arrested in their growth in consequence of the reduced functions of the air.—If not the opening of the mouth, the pointed shape of the upper jaw, so often observed in those belonging to the English nation, may have its origin in hypertrophy of the pharyngeal tonsil.

## CHANGES IN SPEECH AND VOICE, CAUSED BY TUMORS IN THE PHARYNGEAL VAULT.

*G. Passavant* has already shown that in the pronunciation of all the letters except the nasal sounds, a complete shutting off of the pharyngeal vault from the rest of the pharynx takes place.

Aided by favorable circumstances, I was able to place a mirror into the pharyngeal arch of a man, who was supplied with normal parts of the pharynx, and thus I was able to furnish the first description of the actions of the walls of the pharyngeal head, in swallowing, speaking, singing, &c., as viewed from above.\*)

Passavant's statements were confirmed and supplemented in this, that when the patient pronounced an "*em*" or "*en*", the shutting off ensued but lasted only until the sound of the added "*e*" or "*æ*" had passed away. But when only "*mm*" or "*nn*" was pronounced, the shutting off did not take place at all and I could plainly see the vocal cords meet.

With the speculum one can not look down as far as the spot, where the pharyngeal walls meet; but where the nasal cavities are very wide (especially in *ozæna* patients), it is easy to observe the movements of the soft palate in speaking, singing, swallowing, &c., and its relation to the openings of the Eustachian tubes. This was first described by me.†) If the word "*land*" is pronounced, the velum ascends as soon as "*l*" is pronounced; the Eustachian tubes also rise; in this position they remain until "*a*" is pronounced; in "*n*" both sink, and in "*d*" both velum and Eustachian tubes again ascend.

Besides "*m*" and "*n*" all the consonants may be held ever so long, and the velum does not go down until the sound is made and the noise stops.

I have moreover been able to show in my pharyngoscopic studies of the participation of the superior pharyngeal contractor muscle in speaking, that, if in the middle position a moderately strong counter-tone is given, there often remains so much space between the velum and the posterior pharyngeal wall, that one can look up to the pharyngeal roof.

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\*) New observations, &c. *Berlin Klin. Wochenschrift*, 1875, No. 41.



Thus we see, that the irregular vibrations, brought about by the pronunciation of “*m*” or “*n*”, escape exclusively through the pharyngeal vault and the nares. They are therefore imperfect, when the pharyngeal vault, instead of having smooth walls, and being filled with air, is covered with a rugged, sarcomatous growth, which can neither reflect nor be brought into vibration. In cases of a high degree, the sound can enter but imperfectly. The less precisely or definitely, i. e. the shorter these consonants are pronounced, the weaker is the sound, and the more complete is the suppression of it. But if they are prolonged for a time, that is, if the lips and the point of the tongue remain for a time in the requisite action, and if air is forced out more vigorously, then a plain pronunciation is brought about in consequence of the stronger resonance of the bones of the head, especially the superior maxillary.

Of the other consonants it is generally the “*l*” and the “*r*,” which, in consequence of inertia or insufficient action of the tongue, or of a too short and abrupt pronunciation come to the ear indistinct, blurt. By a vigorous, distinct pronunciation of the consonants, which consists in moving the tongue, lips and soft palate with energy, and the continuance of the requisite time in this action, by a soft, clear, free sound, which is free from any mixture of sound, such as is caused by the pressure of the tongue—conditions, which not only bring about a complete shutting off of the pharyngeal vault, but also give the sound a free, unhindered escape through the mouth—it can be accomplished, so that the distorting influence of the hypertrophied pharyngeal tonsil on pronunciation is overcome in a degree.

But the sound is weakened under all circumstances; for the commotions and vibrations of the soft palate cannot spread. Instead of air, they find an unsuitable medium. The resonance is diminished, if not destroyed, as if, for instance, a violin case were partly filled with cloth; the pronunciation is accomplished more or less without the pharyngeal arch. In cases of a high degree with inert, unfit action of the organs, the perversion of speech is quite characteristic. *Meyer* calls it “dead.” It seems as if (as different relatives of the patients diagnosed) something were behind the nares, or behind the soft palate, which would cut off the sound of the word, or the syllable immediately after its origin. Singing is more or less impossible, or very difficult, because the soft palate cannot ascend to the necessary de-

gree, and remain in that position. Hypertrophy to a medium degree always produces a repression of the voice. In consequence, the sound is shorter, non-metallic, more limited, less penetrating.

To make up for the deficiency, and to overcome the obstruction, lungs and larynx are strained to excess; lassitude of the epiglottis, and especially of the real vocal muscle (the internal thyro arytenoid) ensues, causing a gradual weakening of the voice. As has been observed in speaking of the nasal douche, the velum comes in contact with the tumor on the roof, if it (the tumor) is but 1 cm. high. Thus in high notes the velum must overcome a counter-pressure, and strain its power to the utmost. By this over-exertion, its ability to accomplish its functions is finally diminished, and thus the voice generally also suffers a loss.

In my estimation, chronic pharyngeal catarrh causes damage to the voice in the same manner. The rugged tumors on the pharyngeal mucous membrane obstruct and injure the reflex of the voice, producing a snuffled sound, or almost aphonic; while it is not as voluminous and penetrating. In singing, the follicles swell even more in consequence of the stasis of the venus blood, produced by the expiration; the throat is over-heated, dry, and painfully tired; from which a new hindrance arises. The singer or speaker now forces himself to pronounce or sing distinctly. Thus the voice loses its metallic sound—through chronic inflammation, and atrophy of the different muscular fasciculi—as a rubber cord, which is often stretched to its utmost, loses its ability to contract; in other words, its elasticity is lost irrecoverably.

I have, after a cure of chronic catarrh, by method of the galvano-cautery, as recommended by me, often observed that the voice of the patient was clearer, and more metallic, and that it was steadier and more pleasant; I have also observed in others, that they were fast losing the metallic character of their voice through chronic pharyngeal catarrh, which had endured for years.

The pearl-grayish color of the vocal cords, their broad, thick, symmetrical development, the sharpness of the free border, and their normal movements showed that a voice for singing had been possessed,\* which had been lost, not through chronic catarrh of the vocal cords, or the larynx itself, but of the pharynx.

*Gerhard* calls attention to an observation of *Philipaux*, that, where pharyngeal inflammation was present, paralysis of the vocal

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\*Often I found the left vocal cord a little smaller. A few times also, the right one; but in connection with this, I always found the patient to be left-handed.

cords could not be cured by electric treatment. He says that he has twice cured paralytic aphonia by the electric current, but not until after the hypertrophied palatal tonsils had been operated upon. He believes that the central apparatus of the voice—conceded to be in the brain—can be irritated from the pharynx, and thus paralysis can be caused.

According to this theory, it might also be possible that chronic pharyngeal catarrh would frequently cause a damaging irritation of the central apparatus, through which a weakening or paralyzing influence might be brought upon the vocal muscles, by interfering also with their nutrition.

A case lately observed by me may be in place here. A young artillery lieutenant came to consult me about his being hoarse. He thought he had caused it by commanding in too loud a voice. He complained of suffering frequently with throat inflammations. An examination showed that his tonsils were in a state of hypertrophy, especially the left. There were coarse granulations on the posterior and lateral walls of the pharynx. Behind the posterior palatal arches there were elevations having the form of beans. In giving a sound, it could be seen, in the mirror, that the vocal cleft was closed incompletely, especially posteriorly; there were quivering movements in the larynx; while the vocal cords were straining themselves to remain in their position of tension, during the time in which the sound was produced; their strength, however, always failed. By turns they grew broader and smaller. Consequently, the sound became tremulous, quivering, weak, and mixed with misdirected air.

On the second day after galvano-caustic treatment, by which the hypertrophy was removed, the patient came again when he could produce a clear, sure sound. It could now be seen with the mirror that the sound-formation was normal. The widening of the pharyngeal head, through the removal of the hypertrophy of the tonsils, no doubt, had brought about this result. But the following peculiar coincidence in this case seems worthy of note:

The left and most enlarged tonsil was soldered to the posterior palatal arch, and thus it was hanging on to the velum like a piece of lead, when it ought to ascend,—thus hindering its pliability to a high degree. The formation of sound was thus impeded, and a forced expiration—convulsive straining of the vocal cords—was necessary to overcome the difficulty. The voice was exposed to serious danger.

But it was necessary to use the voice sparingly for some time until a removal of the pharyngeal catarrh was effected. Moreover I ordered, that a distinct pronunciation was to be practiced (which I always recommend where the organs are weakened). For a correct use of the breath, ease of the tongue and lips, pliability of the soft palate, in short, a precise pronunciation of the consonants makes the functions of the larynx easy to a high degree.\*)

*Meyer* reports—to return to our theme—that after the tumor has been removed from the pharyngeal vault, the “dead” pronunciation of “*m, n, l*” will often nevertheless remain, and exercise in pronunciation becomes necessary in order to do away with it.

A few cases of this kind have also come under my notice. I at once showed these patients, that they did not hold on to the consonants long enough, which may have been owing to the imperfect sound that had been produced for years; or in part also to the laxity of the lips; or that they opened the mouth too soon in pronouncing “*m*”; or that they touched the hard palate too lightly with the point of the tongue anteriorly in pronouncing “*n, l, d, r.*”

Even in a normal condition the sound of these letters becomes very indistinct by this manner of pronunciation. The consonants should be held onto quite long, pronunciation should be melodious, and patients should two or three times a day, for  $\frac{1}{2}$ —1 hour, read in a moderate power of voice, and before doing this, practice the A B C several times. Those, who carefully followed these directions, had a clear sonorous voice within a few weeks.

I have never found so thick a soft palate, that the breathing and pronunciation remained unimproved after the removal of the tumor, which, I know, is in contradiction to *Meyer's* observations.

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\*) A work worthy of recommendation is *Gymnastic der Stimme*, von *Oscar Guttmann*.

## NASAL SPEECH.

Quite different and easily discerned by a trained ear is the change of speech, caused by abnormities in the nasal cavity. It is noticed, that the sound is hindered in its escape from the nares; it is confined in a closed avenue.

The more anteriorly the obstruction is seated, the more of a nasal sound is produced (*um so mehr brummt die Nase mit*). If the opening of the nares is obstructed, then the alteration of the voice is more like the one just described. The sound becomes dull and abrupt.

The sound becomes weakened, when tumors, situated on the inferior turbinated bone, prevent the vibrations of the hard palate from being communicated to the air contained in the nares; also when polyps and a spongy mucous membrane diminish the volume of air in the cavity; or it is filled with foreign bodies, which cannot be caused to vibrate. Bony incurvations, deformities of the septum, also hinder the sound from flowing out freely. The nasal bones being shaken abnormally strong, reverberate to an audible degree. Indistinct, indolent pronunciation, and an incomplete shutting off of the pharyngeal vault also increase the repression, and serve to produce the nasal character of the sound.

Other kinds of nasal speech, such, for instance, as may be caused by paralysis and defects of the soft palate, do not belong here, but, if I may be allowed, I will speak of a very peculiar case here, which came to my notice.

A boy, H., from Remscheid. 10 years of age, healthy and of a lively disposition, has had, as his father says, an error in his speaking ever since he has been able to speak at all. To all syllables, containing an "s", he gives a perfectly nasal sound, and pronounces them indistinctly as if his palate were paralyzed, or he had a cleft palate. He can not form the sound "s" nor that of "x".

Hitherto all attempts, to explain the cause, and to remove the same, had been in vain. An examination of the nares had not been made; but in inspecting them I found both the nares and the pharyngeal vault to be normal; but it could be seen, looking through the nares, that the velum fell down when "s" was pronounced as if it were "m" or "n". Thus we had here a defective, unsuitable action of the velum in producing the sound "s", existing ever since the boy had tried to speak at all.

I showed the boy, how I could produce a buzzing noise with my incisor teeth placed upon each other, which he soon understood; and after from  $\frac{1}{2}$  to  $\frac{3}{4}$  of an hours practice, he could pronounce "s," and all consonants connected therewith, such as "x, z," etc.; the defect having been removed.

He was advised for sometime yet, daily to practice the pronunciation of "s," and hold on to it in a buzzing manner, in order to bring about perfect ease in pronouncing it.

From that time the boy was cured of the defect to the great astonishment and delight of his friends and teachers. The latter were slow to believe however, that the change had been brought about otherwise than through an operation.

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## THE RELATION OF DEAFNESS TO THE DISEASES JUST DESCRIBED.

Among the 130 patients examined by me (125 of whom were operated upon), who suffered from nasal polyps, there were two, who were affected with progressive deafness, and three old gentlemen with chronic catarrh of the ear, without any subjective noise.

All the rest enjoyed good hearing, only a few complained of transient dull hearing and pressure on one or both ears, when the obstruction in the nares was increased by a fresh acute catarrh.

125 were affected with chronic nasal catarrh (*Stockschnupfen*); 80 of whom were operated upon, while the rest were only examined, and cured with insufflations, of simple catarrh, not accompanied with hypertrophy. Several suffered with hard hearing, but in consequence of a former purulent inflammation of the cavity of the tympanum, and 8 of them suffered with chronic catarrh of the ear; three of whom complained of subjective noise.

Those who suffered at the same time with hypertrophied pharyngeal tonsil, or from polyps having grown out of the choanes, reported most frequently of having acute catarrh of the ear in a moderate degree after contracting cold.

The enlargement of the pharyngeal tonsil was found in 92 cases; 72 cases were operated upon; and only 36 were affected with deafness.



But it must not be overlooked, that in earlier years nearly all had suffered from hard hearing, which gradually passed away, as the cavity grew so much faster than the tumor; and that thus the influence of the latter on the Eustachian tubes became diminished.

We see, then, that the condition of the pharyngeal arch is of more consequence to the ear than that of the nasal cavity.

Though it may be conceded that a vascular tumor of the pharyngeal tonsil is favorable for contracting cold, and for inflammation; and that it converts this (i. e. the cavity) into a *locus minoris resistentialis*, by which catarrh of the middle ear, and perhaps swelling of the "tonsil of the tubes" (*Tubenmandel*), as Gerlach calls the bed of follicles (*Balgäruesenlager*—sub-mucous reticulated tissue) around the Eustachian tubes, is often produced, and even kept up, as the latter and the pharyngeal roof are both supplied by branches of the ascending pharyngeal artery. I believe, nevertheless, that the most obstinate deafness (of the highest degree) is often brought about by the hypertrophied pharyngeal tonsil in a mechanical way.

The tumor prevents, in acts of swallowing, the soft palate, and with it the Eustachian tubes, from ascending as high as is necessary.

Just how detrimental this influence must be, is seen from the fact (as my examinations with the mirror have demonstrated), that the Eustachian orifice is not opened until at the moment when these parts are raised to their highest point through the act of swallowing. To illustrate further what has just been said, I copy a few paragraphs from my article published in No. 41. 1875, of the *Berliner Klinische Wochenschrift*.

"The movements of the Eustachian tubes are so very prominent, that there can be no doubt that Our Maker has designed them as necessary to the hearing of sound. In my estimation it is established that, without this raising of the Eustachian tubes, the tensor, *i. e.*, the dilator of the tubes, can work but insufficiently, and thus open the tubes only inadequately. The knowledge that patients, afflicted with deafness, while suffering at the same time with an enlarged pharyngeal tonsil, could hear much better or quite normal after the swelling had been removed, and this, too, without any other treatment of the ears, has strengthened me in this belief.

"The tumor, situated behind the Eustachian tubes, prevents the movements of these, and prevents its being lifted off the anterior wall of the orifice; but on the contrary in swallowing, the

openings of the tubes are pressed between the soft palate and the tumor, and thus become closed rather than opened, by which the ventilation of the cavity of the tympanum is prevented to a greater or lesser degree.

“A case of deafness came to me of from 5—10 years standing, or even longer, against which specialists of eminence could only obtain transient results, but which improved immediately after the first or second operation, and then—keeping pace with the removal of the tumor—was cured completely and radically, by the complete removal of the tumor. But if the cause had been swelling or inflammation in the tympanic cavity (*im schall-leitenden Apparate*—in the apparatus for conducting the sound), this result could not have been reached thus; and shows that it must have been caused by a mechanical closure of the opening of the Eustachian tubes, as described before.

“How much the mobility—the raising of the soft palate (on which the moving of the Eustachian tubes depends), is prevented, may be seen from the fact, that after those parts of the tumor which filled the fossa of Rosenmueller have been removed by the operation, the rhinoscopy, and rhinoscopic application of the galvano-cautery—which previously could have been accomplished quite easily—can now only be done with the greatest difficulty,—if at all—because the velum pressing against the posterior wall, (at least touching it), entirely prevents an upward view into the cavity.

“Speaking, and especially the holding to high notes in singing, which, as is well known, calls for a strong upheaval of the velum, is very difficult, if not impossible, (a fact to which *Meyer* has already called attention), because of the resistance offered by the tumor. It does not always suffice, therefore, to examine the larynx when the voice is affected.

“*Meyer* also calls attention to the fact that hard hearing is characteristic with patients who suffer from hypertrophy of the pharyngeal tonsil; that it is difficult of cure, and that the inhalation of air does not bring the hearing back to a normal condition, until after the vegetations have been removed; and whilst this can not be brought about before the operation through any treatment, it is often accomplished through the operation alone, without any other treatment.

“I can but confirm the experience of *Meyer*, and believe,

that I can explain it in part by my view of the influence of the tumor upon the Eustachian orifice in swallowing, etc., as expressed above."

In case of catarrh of the middle-ear, great stress has been laid on the condition of the pharynx; but after I have demonstrated, that the pharyngeal tonsil is very often found in a state of hypertrophy, certainly not much less often than the palatal tonsils, one ought not to neglect the examination of the pharyngeal head of every patient, who is affected with a chronic deafness. If the requisite skill for examination and operation has been acquired one will often be astonished at seeing what result may be reached more or less quickly, often unexpectedly, and he will, no doubt, be influenced thereby in future to lose no time or labor with the air-douche and injections, before bringing the pharyngeal head into its normal condition again.

FINIS.

## ERRATA.

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Page 9 on the 9th line read grow for grows.

Page 9 on the 19th line read galvano-cautery for galvano-caustery.

Page 10 on the 2d line read " " for " "

Page 15 on the 12th line read site for side.

Page 78 on the 1st line read Pharyngeal for Pharingeal.

## CONTENTS.

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	Page.
INTRODUCTION TO AMERICAN EDITION.	
PREFACE.	
INTRODUCTION .....	7
EXAMINATION OF THE NASAL CAVITY.....	
Anteriorly .....	11
Posteriorly .....	14
DISEASES OF THE NASAL CAVITY.....	
Acute Catarrh.....	18
Chronic Catarrh.....	22
Deformities in the Nasal Cavity.....	33
Ozæna .....	35
Syphilis in the Nasal Cavity.....	50
Nasal Polyps.....	57
Papillomata .....	72
Malignant Tumors.....	73
Epistaxis.....	75
Foreign Bodies in the Nasal Cavity. ....	77
DISEASES OF THE PHARYNGEAL VAULT.....	
Ulcers.....	78
Hypertrophy of the Pharyngeal Tonsil....	81
CONSEQUENCES OF OBSTRUCTION IN THE NARES AND PHARYNGEAL VAULT .....	96
CHANGES IN SPEECH AND VOICE, CAUSED BY TUMORS IN THE PHAR- YNGEAL VAULT.....	100
NASAL SPEECH.....	105
RELATION OF DEAFNESS TO THE DISEASES DESCRIBED.....	106

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DISEASES

OF

THE NASAL CAVITY

AND THE

VAULT OF THE PHARYNX.

✓

TRANSLATED FROM THE GERMAN OF

DR. CARL MICHEL, OF COLOGNE ON THE RHINE,

SPECIALIST IN LARYNGO- AND RHINOSCOPIC SURGERY,

WITH AN INTRODUCTION BY

E. L. SHURLY, M. D., AND C. C. YEMANS, M. D.,

OF DETROIT, MICHIGAN.

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